

SEQUENCE LISTING

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10 <120> Resistant plants and uses thereof

<130> AE 20030596

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<160> 94

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<170> PatentIn version 3.1

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<212> DNA

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<222> (1)..(3804)

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ttt tct gct ctt cgc aag gat gct gcc aat gtt ctg gat ttc cta gag 96
Phe Ser Ala Leu Arg Lys Asp Ala Ala Asn Val Leu Asp Phe Leu Glu
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aga tta aag aat gaa gaa gat caa aag gct gtt gat gtg gat ctg att 144
Arg Leu Lys Asn Glu Glu Asp Gln Lys Ala Val Asp Val Asp Leu Ile
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gaa agc ctg aaa ttg aag ctg aca ttt att tgt aca tat gtc cag ctt 192
Glu Ser Leu Lys Leu Lys Leu Thr Phe Ile Cys Thr Tyr Val Gln Leu
50 55 60

65

tct tat tcc gat ttg gag aag ttt gaa gat ata atg act aga aaa aga 240
Ser Tyr Ser Asp Leu Lys Phe Glu Asp Ile Met Thr Arg Lys Arg
65 70 75 80

caa gag gtt gag aat ctg ctt caa cca att ttg gat gat gat ggc aaa 288
Gln Glu Val Glu Asn Leu Leu Gln Pro Ile Leu Asp Asp Asp Gly Lys
85 90 95

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| | gac gtc ggg tgt aaa tat gtc ctt act agc ctc gcc ggt aat atg gat Asp Val Gly Cys Lys Tyr Val Leu Thr Ser Leu Ala Gly Asn Met Asp 100 105 110 | 336 |
| 5 | gac tgt ata agc ttg tat cat cgt tct aaa tca gat gcc acc atg atg Asp Cys Ile Ser Leu Tyr His Arg Ser Lys Ser Asp Ala Thr Met Met 115 120 125 | 384 |
| 10 | gat gag caa ttg ggc ttc ctc ctc ttg aat ctc tct cat cta tcc aag Asp Glu Gln Leu Gly Phe Leu Leu Leu Asn Leu Ser His Leu Ser Lys 130 135 140 | 432 |
| 15 | cat cgt gct gaa aag atg ttt cct gga gtg act caa tat gag gtt ctt His Arg Ala Glu Lys Met Phe Pro Gly Val Thr Gln Tyr Glu Val Leu 145 150 155 160 | 480 |
| 20 | cag aat gta tgt ggc aac ata aga gat ttc cat gga ttg ata gtg aat Gln Asn Val Cys Gly Asn Ile Arg Asp Phe His Gly Leu Ile Val Asn 165 170 175 | 528 |
| 25 | tgt tgc att aag cat gag atg gtt gag aat gtc tta tct ctg ttt caa Cys Cys Ile Lys His Glu Met Val Glu Asn Val Leu Ser Leu Phe Gln 180 185 190 | 576 |
| 30 | ctg atg gct gag aga gta gga cgc ttc ctt tgg gag gat cag gct gat Leu Met Ala Glu Arg Val Gly Arg Phe Leu Trp Glu Asp Gln Ala Asp 195 200 205 | 624 |
| 35 | gaa gac tct caa ctc tcc gag cta gat gag gat gat cag aat gat aaa Glu Asp Ser Gln Leu Ser Glu Leu Asp Glu Asp Asp Gln Asn Asp Lys 210 215 220 | 672 |
| 40 | gac cct caa ctc ttc aag cta gca cat cta ctc ttg aag att gtt cca Asp Pro Gln Leu Phe Lys Leu Ala His Leu Leu Leu Lys Ile Val Pro 225 230 235 240 | 720 |
| 45 | act gaa ttg gag gtt atg cac ata tgt tat aaa act ttg aaa gct tca Thr Glu Leu Glu Val Met His Ile Cys Tyr Lys Thr Leu Lys Ala Ser 245 250 255 | 768 |
| 50 | act tca aca gaa att gga cgc ttc att aag aag ctc ctg gaa acc tct Thr Ser Thr Glu Ile Gly Arg Phe Ile Lys Lys Leu Leu Glu Thr Ser 260 265 270 | 816 |
| 55 | ccg gac att ctc aga gaa tat ctg att cat cta caa gag cat atg ata Pro Asp Ile Leu Arg Glu Tyr Leu Ile His Leu Gln Glu His Met Ile 275 280 285 | 864 |
| 60 | act gtt att acc cct aac act tca ggg gct cga aac att cat gtc atg Thr Val Ile Thr Pro Asn Thr Ser Gly Ala Arg Asn Ile His Val Met 290 295 300 | 912 |
| 65 | atg gaa ttc cta ttg att att ctt tct gat atg ccg ccc aag gac ttt Met Glu Phe Leu Leu Ile Ile Leu Ser Asp Met Pro Pro Lys Asp Phe 305 310 315 320 | 960 |
| 70 | att cat cat gac aaa ctt ttt gat ctc ttg gct cgt gtt gta gca ctt Ile His His Asp Lys Leu Phe Asp Leu Leu Ala Arg Val Val Ala Leu 325 330 335 | 1008 |
| 75 | acc agg gag gta tca act ctt gta cgc gac ttg gaa gag aaa tta agg Thr Arg Glu Val Ser Thr Leu Val Arg Asp Leu Glu Glu Lys Leu Arg 340 345 350 | 1056 |
| 80 | att aaa gag agt act gac gaa aca aat tgt gca acc cta aag ttt ctg Ile Lys Glu Ser Thr Asp Glu Thr Asn Cys Ala Thr Leu Lys Phe Leu 355 360 365 | 1104 |

3

| | | |
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| | gaa aat att gaa ctc ctt aag gaa gat ctc aaa cat gtt tat ctg aaa | 1152 |
| | Glu Asn Ile Glu Leu Leu Lys Glu Asp Leu Lys His Val Tyr Leu Lys | |
| | 370 375 380 | |
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| | Val Pro Asp Ser Ser Gln Tyr Cys Phe Pro Met Ser Asp Gly Pro Leu | |
| | 385 390 395 400 | |
| 10 | ttc atg cat ctg cta cag aga cac tta gat gat ttg ctg gat tcc aat | 1248 |
| | Phe Met His Leu Leu Gln Arg His Leu Asp Asp Leu Leu Asp Ser Asn | |
| | 405 410 415 | |
| 15 | gct tat tca att gct ttg ata aag gaa caa att ggg ctg gtg aaa gaa | 1296 |
| | Ala Tyr Ser Ile Ala Leu Ile Lys Glu Gln Ile Gly Leu Val Lys Glu | |
| | 420 425 430 | |
| 20 | gac ttg gaa ttc ata aga tct ttt ttc gcg aat att gag caa gga ttg | 1344 |
| | Asp Leu Glu Phe Ile Arg Ser Phe Phe Ala Asn Ile Glu Gln Gly Leu | |
| | 435 440 445 | |
| 25 | tat aaa gat ctc tgg gaa cgt gtt cta gat gtg gca tat gag gca aaa | 1392 |
| | Tyr Lys Asp Leu Trp Glu Arg Val Leu Asp Val Ala Tyr Glu Ala Lys | |
| | 450 455 460 | |
| 30 | gat gtc ata gat tca att att gtt cga gat aat ggt ctc tta cat ctt | 1440 |
| | Asp Val Ile Asp Ser Ile Ile Val Arg Asp Asn Gly Leu Leu His Leu | |
| | 465 470 475 480 | |
| 35 | att ttc tca ctt ccc att acc aga aag aag atg atg ctt atc aaa gaa | 1488 |
| | Ile Phe Ser Leu Pro Ile Thr Arg Lys Lys Met Met Leu Ile Lys Glu | |
| | 485 490 495 | |
| 40 | gag gtc tct gat tta cat gag aac att tcc aag aac aga ggt ctc atc | 1536 |
| | Glu Val Ser Asp Leu His Glu Asn Ile Ser Lys Asn Arg Gly Leu Ile | |
| | 500 505 510 | |
| 45 | gtt gtg aac tct ccc aag aaa cca gtt gag agc aag tca ttg aca act | 1584 |
| | Val Val Asn Ser Pro Lys Lys Pro Val Glu Ser Lys Ser Leu Thr Thr | |
| | 515 520 525 | |
| 50 | gat aaa ata att gta ggt ttt ggt gag gag aca aac ttg ata ctt aga | 1632 |
| | Asp Lys Ile Ile Val Gly Phe Gly Glu Glu Thr Asn Leu Ile Leu Arg | |
| | 530 535 540 | |
| 55 | aag ctc acc agt gga ccg gca gat cta gat gtc att tcg atc att ggt | 1680 |
| | Lys Leu Thr Ser Gly Pro Ala Asp Leu Asp Val Ile Ser Ile Ile Gly | |
| | 545 550 555 560 | |
| 60 | atg ccg ggt tta ggt aaa act act ttg gcg tac aaa gta tac aat gat | 1728 |
| | Met Pro Gly Leu Gly Lys Thr Thr Leu Ala Tyr Lys Val Tyr Asn Asp | |
| | 565 570 575 | |
| 65 | aaa tca gtt tct agc cat ttc gac ctt cgt gca tgg tgc acg gtc gac | 1776 |
| | Lys Ser Val Ser Ser His Phe Asp Leu Arg Ala Trp Cys Thr Val Asp | |
| | 580 585 590 | |
| 70 | caa gta tat gac gag aag aag ttg ttg gat aaa att ttc aat caa gtt | 1824 |
| | Gln Val Tyr Asp Glu Lys Lys Leu Leu Asp Lys Ile Phe Asn Gln Val | |
| | 595 600 605 | |
| 75 | agt gac tca aat tca aaa ttg agt gag aat att gat gtt gct gat aaa | 1872 |
| | Ser Asp Ser Asn Ser Lys Leu Ser Glu Asn Ile Asp Val Ala Asp Lys | |
| | 610 615 620 | |
| 80 | cta cgg aaa caa ttg ttt gga aag agg tat ctt att gtc tta gat gac | 1920 |
| | Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr Leu Ile Val Leu Asp Asp | |
| | 625 630 635 640 | |

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| | gtg tgg gat act aat aca tgg gat gag cta aca aga cct ttt cct gat | 1968 |
| | Val Trp Asp Thr Asn Thr Trp Asp Glu Leu Thr Arg Pro Phe Pro Asp | |
| | 645 650 655 | |
| 5 | ggt atg aaa gga agt aga att att ttg aca act cga gaa aag aaa gtt | 2016 |
| | Gly Met Lys Gly Ser Arg Ile Ile Leu Thr Thr Arg Glu Lys Lys Val | |
| | 660 665 670 | |
| 10 | gct ttg cat gga aag ctc tac act gat cct ctt aac ctt cga ttg cta | 2064 |
| | Ala Leu His Gly Lys Leu Tyr Thr Asp Pro Leu Asn Leu Arg Leu Leu | |
| | 675 680 685 | |
| 15 | aga tca gaa gaa agt tgg gag tta tta gag aaa agg gca ttt gga aac | 2112 |
| | Arg Ser Glu Glu Ser Trp Glu Leu Leu Glu Lys Arg Ala Phe Gly Asn | |
| | 690 695 700 | |
| 20 | gag agt tgc cct gat gaa cta ttg gat gtt ggt aaa gaa ata gcc gaa | 2160 |
| | Glu Ser Cys Pro Asp Glu Leu Leu Asp Val Gly Lys Glu Ile Ala Glu | |
| | 705 710 715 720 | |
| 20 | aat tgt aaa ggg ctt cct ttg gtg gtg gat ctg att gct gga atc att | 2208 |
| | Asn Cys Lys Gly Leu Pro Leu Val Val Asp Leu Ile Ala Gly Ile Ile | |
| | 725 730 735 | |
| 25 | gct ggg agg gaa aag aaa aag agt gtg tgg ctt gaa gtt gta aat aat | 2256 |
| | Ala Gly Arg Glu Lys Lys Lys Ser Val Trp Leu Glu Val Val Asn Asn | |
| | 740 745 750 | |
| 30 | ttg cat tcc ttt att ttg aag aat gaa gtg gaa gtg atg aaa gtt ata | 2304 |
| | Leu His Ser Phe Ile Leu Lys Asn Glu Val Glu Val Met Lys Val Ile | |
| | 755 760 765 | |
| 35 | gaa ata agt tat gac cac tta cct gat cac ctg aag cca tgc ttg ctg | 2352 |
| | Glu Ile Ser Tyr Asp His Leu Pro Asp His Leu Lys Pro Cys Leu Leu | |
| | 770 775 780 | |
| 40 | tac ttt gca agt gcg ccg aag gac tgg gta acg aca atc cat gag ttg | 2400 |
| | Tyr Phe Ala Ser Ala Pro Lys Asp Trp Val Thr Thr Ile His Glu Leu | |
| | 785 790 795 800 | |
| 40 | aaa ctt att tgg ggt ttt gaa gga ttt gtg gaa aag aca gat atg aag | 2448 |
| | Lys Leu Ile Trp Gly Phe Glu Gly Phe Val Glu Lys Thr Asp Met Lys | |
| | 805 810 815 | |
| 45 | agt ctg gaa gaa gtg gtg aaa att tat ttg gat gat tta att tcc agt | 2496 |
| | Ser Leu Glu Glu Val Val Lys Ile Tyr Leu Asp Asp Leu Ile Ser Ser | |
| | 820 825 830 | |
| 50 | agc ttg gta att tgt ttc aat gag ata ggt gat tac cct act tgc caa | 2544 |
| | Ser Leu Val Ile Cys Phe Asn Glu Ile Gly Asp Tyr Pro Thr Cys Gln | |
| | 835 840 845 | |
| 55 | ctt cat gat ctt gtg cat gac ttt tgt ttg ata aaa gca aga aag gaa | 2592 |
| | Leu His Asp Leu Val His Asp Phe Cys Leu Ile Lys Ala Arg Lys Glu | |
| | 850 855 860 | |
| 60 | aag ttg tgt gat cgg ata agt tca agt gct cca tca gat ttg ttg cca | 2640 |
| | Lys Leu Cys Asp Arg Ile Ser Ser Ser Ala Pro Ser Asp Leu Leu Pro | |
| | 865 870 875 880 | |
| 60 | cgt caa att agc att gat tat gat gat gat gaa gag cac ttt ggg ctt | 2688 |
| | Arg Gln Ile Ser Ile Asp Tyr Asp Asp Asp Glu Glu His Phe Gly Leu | |
| | 885 890 895 | |
| 65 | aat ttt gtc ctg ttc ggt tca aat aag aaa agg cat tcc ggt aaa cac | 2736 |
| | Asn Phe Val Leu Phe Gly Ser Asn Lys Lys Arg His Ser Gly Lys His | |
| | 900 905 910 | |

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|----|---|------|
| | ctc tat tct ttg acc ata aat gga gat gag ctg gac gac cat ctt tct | 2784 |
| | Leu Tyr Ser Leu Thr Ile Asn Gly Asp Glu Leu Asp Asp His Leu Ser | |
| | 915 920 925 | |
| 5 | gat aca ttt cat cta aga cac ttg agg ctt ctt aga acc ttg cac ctg | 2832 |
| | Asp Thr Phe His Leu Arg His Leu Arg Leu Leu Arg Thr Leu His Leu | |
| | 930 935 940 | |
| 10 | gaa tcc tct ttt atc atg gtt aaa gat tct ttg ctg aat gaa ata tgc | 2880 |
| | Glu Ser Ser Phe Ile Met Val Lys Asp Ser Leu Leu Asn Glu Ile Cys | |
| | 945 950 955 960 | |
| 15 | atg ttg aat cat ttg agg tac tta agc att ggg aca gaa gtt aaa tct | 2928 |
| | Met Leu Asn His Leu Arg Tyr Leu Ser Ile Gly Thr Glu Val Lys Ser | |
| | 965 970 975 | |
| 20 | ctg cct ttg tct ttc tca aac ctc tgg aat cta gaa atc ttg ttt gtg | 2976 |
| | Leu Pro Leu Ser Phe Ser Asn Leu Trp Asn Leu Glu Ile Leu Phe Val | |
| | 980 985 990 | |
| 25 | gat aac aaa gaa tca acc ttg ata cta tta ccg aga att tgg gat ctt | 3024 |
| | Asp Asn Lys Glu Ser Thr Leu Ile Leu Leu Pro Arg Ile Trp Asp Leu | |
| | 995 1000 1005 | |
| 30 | gta aag ttg caa gtg ctg ttc acg act gct tgt tct ttc ttt gat | 3069 |
| | Val Lys Leu Gln Val Leu Phe Thr Thr Ala Cys Ser Phe Phe Asp | |
| | 1010 1015 1020 | |
| 35 | atg gat gca gat gaa tca ata ctg ata gca gag gac aca aag tta | 3114 |
| | Met Asp Ala Asp Glu Ser Ile Leu Ile Ala Glu Asp Thr Lys Leu | |
| | 1025 1030 1035 | |
| 40 | gat aca gag gat att ttc aaa agg ctt ccc aat ctt caa gtg ctt | 3204 |
| | Asp Thr Glu Asp Ile Phe Lys Arg Leu Pro Asn Leu Gln Val Leu | |
| | 1055 1060 1065 | |
| 45 | cat ttc aaa ctc aag gag tca tgg gat tat tca aca gag caa tat | 3249 |
| | His Phe Lys Leu Lys Glu Ser Trp Asp Tyr Ser Thr Glu Gln Tyr | |
| | 1070 1075 1080 | |
| 50 | tgg ttc ccg aaa ttg gat ttc cta act gaa cta gaa aaa ctc act | 3294 |
| | Trp Phe Pro Lys Leu Asp Phe Leu Thr Glu Leu Glu Lys Leu Thr | |
| | 1085 1090 1095 | |
| 55 | gta gat ttt gaa aga tca aac aca aat gac agt ggg tcc tct gca | 3339 |
| | Val Asp Phe Glu Arg Ser Asn Thr Asn Asp Ser Gly Ser Ser Ala | |
| | 1100 1105 1110 | |
| 60 | gcc ata aat cgg cca tgg gat ttt cac ttt cct tcg agt ttg aaa | 3384 |
| | Ala Ile Asn Arg Pro Trp Asp Phe His Phe Pro Ser Ser Leu Lys | |
| | 1115 1120 1125 | |
| 65 | aga ttg caa ttg cat gaa ttt cct ctg aca tcc gat tca cta tca | 3429 |
| | Arg Leu Gln Leu His Glu Phe Pro Leu Thr Ser Asp Ser Leu Ser | |
| | 1130 1135 1140 | |
| 70 | aca ata gcg aga ctg ctg aac ctt gaa gag ttg tac ctt tat cgt | 3474 |
| | Thr Ile Ala Arg Leu Leu Asn Leu Glu Glu Leu Tyr Leu Tyr Arg | |
| | 1145 1150 1155 | |
| 75 | aca atc atc cat ggg gaa gaa tgg aac atg gga gaa gaa gac acc | 3519 |
| | Thr Ile Ile His Gly Glu Glu Trp Asn Met Gly Glu Glu Asp Thr | |
| | 1160 1165 1170 | |

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| | ttt gag aat ctc aaa tgt ttg atg ttg agt caa gtg att ctt tcc | 3564 |
| | Phe Glu Asn Leu Lys Cys Leu Met Leu Ser Gln Val Ile Leu Ser | |
| | 1175 1180 1185 | |
| 5 | aag tgg gag gtt gga gag gaa tct ttt ccc acg ctt gag aaa tta | 3609 |
| | Lys Trp Glu Val Gly Glu Glu Ser Phe Pro Thr Leu Glu Lys Leu | |
| | 1190 1195 1200 | |
| 10 | gaa ctg tcg gac tgt cat aat ctt gag gag att ccg tct agt ttt | 3654 |
| | Glu Leu Ser Asp Cys His Asn Leu Glu Glu Ile Pro Ser Ser Phe | |
| | 1205 1210 1215 | |
| 15 | ggg gat att tat tcc ttg aaa att atc gaa ctt gta agg agc cct | 3699 |
| | Gly Asp Ile Tyr Ser Leu Lys Ile Ile Glu Leu Val Arg Ser Pro | |
| | 1220 1225 1230 | |
| 20 | caa ctt gaa aat tcc gct ctc aag att aag gaa tat gct gaa gat | 3744 |
| | Gln Leu Glu Asn Ser Ala Leu Lys Ile Lys Glu Tyr Ala Glu Asp | |
| | 1235 1240 1245 | |
| 25 | atg agg gga ggg gac gag ctt cag atc ctt ggc cag aag gat atc | 3789 |
| | Met Arg Gly Gly Asp Glu Leu Gln Ile Leu Gly Gln Lys Asp Ile | |
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| | Pro Leu Phe Lys | |
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| | 20 25 30 | |
| 55 | Arg Leu Lys Asn Glu Glu Asp Gln Lys Ala Val Asp Val Asp Leu Ile | |
| | 35 40 45 | |
| 60 | Glu Ser Leu Lys Leu Lys Leu Thr Phe Ile Cys Thr Tyr Val Gln Leu | |
| | 50 55 60 | |
| 65 | Ser Tyr Ser Asp Leu Glu Lys Phe Glu Asp Ile Met Thr Arg Lys Arg | |
| | 65 70 75 80 | |
| 70 | Gln Glu Val Glu Asn Leu Leu Gln Pro Ile Leu Asp Asp Asp Gly Lys | |
| | 85 90 95 | |
| 75 | Asp Val Gly Cys Lys Tyr Val Leu Thr Ser Leu Ala Gly Asn Met Asp | |
| | 100 105 110 | |

Asp Cys Ile Ser Leu Tyr His Arg Ser Lys Ser Asp Ala Thr Met Met
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5 Asp Glu Gln Leu Gly Phe Leu Leu Leu Asn Leu Ser His Leu Ser Lys
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10 His Arg Ala Glu Lys Met Phe Pro Gly Val Thr Gln Tyr Glu Val Leu
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15 Gln Asn Val Cys Gly Asn Ile Arg Asp Phe His Gly Leu Ile Val Asn
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20 Cys Cys Ile Lys His Glu Met Val Glu Asn Val Leu Ser Leu Phe Gln
 180 185 190

Leu Met Ala Glu Arg Val Gly Arg Phe Leu Trp Glu Asp Gln Ala Asp
 195 200 205

25 Glu Asp Ser Gln Leu Ser Glu Leu Asp Glu Asp Asp Gln Asn Asp Lys
 210 215 220

30 Asp Pro Gln Leu Phe Lys Leu Ala His Leu Leu Leu Lys Ile Val Pro
 225 230 235 240

35 Thr Glu Leu Glu Val Met His Ile Cys Tyr Lys Thr Leu Lys Ala Ser
 245 250 255

40 Thr Ser Thr Glu Ile Gly Arg Phe Ile Lys Lys Leu Leu Glu Thr Ser
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Pro Asp Ile Leu Arg Glu Tyr Leu Ile His Leu Gln Glu His Met Ile
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45 Thr Val Ile Thr Pro Asn Thr Ser Gly Ala Arg Asn Ile His Val Met
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55 Ile His His Asp Lys Leu Phe Asp Leu Leu Ala Arg Val Val Ala Leu
 325 330 335

60 Thr Arg Glu Val Ser Thr Leu Val Arg Asp Leu Glu Glu Lys Leu Arg
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65 Glu Asn Ile Glu Leu Leu Lys Glu Asp Leu Lys His Val Tyr Leu Lys
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Val Pro Asp Ser Ser Gln Tyr Cys Phe Pro Met Ser Asp Gly Pro Leu
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5 Phe Met His Leu Leu Gln Arg His Leu Asp Asp Leu Leu Asp Ser Asn
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10 Ala Tyr Ser Ile Ala Leu Ile Lys Glu Gln Ile Gly Leu Val Lys Glu
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15 Asp Leu Glu Phe Ile Arg Ser Phe Phe Ala Asn Ile Glu Gln Gly Leu
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20 Tyr Lys Asp Leu Trp Glu Arg Val Leu Asp Val Ala Tyr Glu Ala Lys
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Asp Val Ile Asp Ser Ile Ile Val Arg Asp Asn Gly Leu Leu His Leu
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25 Ile Phe Ser Leu Pro Ile Thr Arg Lys Lys Met Met Leu Ile Lys Glu
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30 Glu Val Ser Asp Leu His Glu Asn Ile Ser Lys Asn Arg Gly Leu Ile
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35 Val Val Asn Ser Pro Lys Lys Pro Val Glu Ser Lys Ser Leu Thr Thr
 515 520 525

40 Asp Lys Ile Ile Val Gly Phe Gly Glu Glu Thr Asn Leu Ile Leu Arg
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Lys Leu Thr Ser Gly Pro Ala Asp Leu Asp Val Ile Ser Ile Ile Gly
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45 Met Pro Gly Leu Gly Lys Thr Thr Leu Ala Tyr Lys Val Tyr Asn Asp
 565 570 575

50 Lys Ser Val Ser Ser His Phe Asp Leu Arg Ala Trp Cys Thr Val Asp
 580 585 590

55 Gln Val Tyr Asp Glu Lys Lys Leu Leu Asp Lys Ile Phe Asn Gln Val
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60 Ser Asp Ser Asn Ser Lys Leu Ser Glu Asn Ile Asp Val Ala Asp Lys
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Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr Leu Ile Val Leu Asp Asp
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65 Val Trp Asp Thr Asn Thr Trp Asp Glu Leu Thr Arg Pro Phe Pro Asp
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Gly Met Lys Gly Ser Arg Ile Ile Leu Thr Thr Arg Glu Lys Lys Val
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5

Ala Leu His Gly Lys Leu Tyr Thr Asp Pro Leu Asn Leu Arg Leu Leu
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Arg Ser Glu Glu Ser Trp Glu Leu Leu Glu Lys Arg Ala Phe Gly Asn
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Glu Ser Cys Pro Asp Glu Leu Leu Asp Val Gly Lys Glu Ile Ala Glu
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Asn Cys Lys Gly Leu Pro Leu Val Val Asp Leu Ile Ala Gly Ile Ile
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25

Ala Gly Arg Glu Lys Lys Lys Ser Val Trp Leu Glu Val Val Asn Asn
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Leu His Ser Phe Ile Leu Lys Asn Glu Val Glu Val Met Lys Val Ile
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Glu Ile Ser Tyr Asp His Leu Pro Asp His Leu Lys Pro Cys Leu Leu
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Tyr Phe Ala Ser Ala Pro Lys Asp Trp Val Thr Thr Ile His Glu Leu
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Lys Leu Ile Trp Gly Phe Glu Gly Phe Val Glu Lys Thr Asp Met Lys
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Ser Leu Glu Glu Val Val Lys Ile Tyr Leu Asp Asp Leu Ile Ser Ser
 820 825 830

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Ser Leu Val Ile Cys Phe Asn Glu Ile Gly Asp Tyr Pro Thr Cys Gln
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Leu His Asp Leu Val His Asp Phe Cys Leu Ile Lys Ala Arg Lys Glu
 850 855 860

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Lys Leu Cys Asp Arg Ile Ser Ser Ser Ala Pro Ser Asp Leu Leu Pro
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Arg Gln Ile Ser Ile Asp Tyr Asp Asp Asp Glu Glu His Phe Gly Leu
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Asn Phe Val Leu Phe Gly Ser Asn Lys Lys Arg His Ser Gly Lys His
 900 905 910

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Leu Tyr Ser Leu Thr Ile Asn Gly Asp Glu Leu Asp Asp His Leu Ser
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Asp Thr Phe His Leu Arg His Leu Arg Leu Leu Arg Thr Leu His Leu
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 Trp Phe Pro Lys Leu Asp Phe Leu Thr Glu Leu Glu Lys Leu Thr
 1085 1090 1095
 45 Val Asp Phe Glu Arg Ser Asn Thr Asn Asp Ser Gly Ser Ser Ala
 1100 1105 1110
 50 Ala Ile Asn Arg Pro Trp Asp Phe His Phe Pro Ser Ser Leu Lys
 1115 1120 1125
 55 Arg Leu Gln Leu His Glu Phe Pro Leu Thr Ser Asp Ser Leu Ser
 1130 1135 1140
 60 Thr Ile Ala Arg Leu Leu Asn Leu Glu Glu Leu Tyr Leu Tyr Arg
 1145 1150 1155
 Thr Ile Ile His Gly Glu Glu Trp Asn Met Gly Glu Glu Asp Thr
 1160 1165 1170
 65 Phe Glu Asn Leu Lys Cys Leu Met Leu Ser Gln Val Ile Leu Ser
 1175 1180 1185

Lys Trp Glu Val Gly Glu Glu Ser Phe Pro Thr Leu Glu Lys Leu
 1190 1195 1200

5

Glu Leu Ser Asp Cys His Asn Leu Glu Glu Ile Pro Ser Ser Phe
 1205 1210 1215

10

Gly Asp Ile Tyr Ser Leu Lys Ile Ile Glu Leu Val Arg Ser Pro
 1220 1225 1230

15

Gln Leu Glu Asn Ser Ala Leu Lys Ile Lys Glu Tyr Ala Glu Asp
 1235 1240 1245

20

Met Arg Gly Gly Asp Glu Leu Gln Ile Leu Gly Gln Lys Asp Ile
 1250 1255 1260

25

Pro Leu Phe Lys
 1265

<210> 3
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30

<212> DNA
 <213> Solanum bulbocastanum

35

<220>
 <221> gene

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<222> (1)..(3890)
 <223> Coding nucleic acid sequence of the Rpi-blb2 gene including the i
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45

<220>
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50

<222> (43)..(128)
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 tgaactgtaa agtattgaat tgtagatatt atgtggcttt aaaaatttga tatgtgttat 120
 tttggcagga gtcattttct gctcttcgca aggatgctgc caatgttctg gatttcctag 180
 65 agagattaaa gaatgaagaa gatcaaaagg ctgttgatgt ggatctgatt gaaagcctga 240
 aattgaagct gacattttatt tgtacatatg tccagctttc ttattccgat ttggagaagt 300

| | | |
|----|---|------|
| | ttgaagatat aatgactaga aaaagacaag aggttgagaa tctgcttcaa ccaatthttgg | 360 |
| | atgatgatgg caaagacgtc ggggtgaaat atgtccttac tagcctcgcc ggtaatatgg | 420 |
| 5 | atgactgtat aagcttgtat catcgttcta aatcagatgc caccatgatg gatgagcaat | 480 |
| | tgggcttcct cctcttgaat ctctctcatc tatccaagca tcgtgctgaa aagatgtttc | 540 |
| 10 | ctggagtgac tcaatatgag gttcttcaga atgtatgtgg caacataaga gattttccatg | 600 |
| | gattgatagt gaattgttgc attaagcatg agatgggttga gaatgtctta tctctgtttc | 660 |
| | aactgatggc tgagagagta ggacgcttcc tttgggagga tcaggctgat gaagactctc | 720 |
| 15 | aactctccga gctagatgag gatgatcaga atgataaaga ccttcaactc ttcaagctag | 780 |
| | cacatctact cttgaagatt gttccaactg aattggaggt tatgcacata tgttataaaa | 840 |
| 20 | ctttgaaagc ttcaacttca acagaaattg gacgcttcat taagaagctc ctggaaacct | 900 |
| | ctccggacat tctcagagaa tatctgattc atctacaaga gcatatgata actgttatta | 960 |
| | cccctaacac ttcaggggct cgaaacattc atgtcatgat ggaattccta ttgattattc | 1020 |
| 25 | tttctgatat gccgcccaag gactttattc atcatgacaa actttttgat ctcttggtc | 1080 |
| | gtgttgtagc acttaccagg gaggtatcaa ctcttgtagc cgacttggaa gagaaattaa | 1140 |
| 30 | ggattaaaga gactactgac gaaacaaatt gtgcaaccct aaagtttctg gaaaatattg | 1200 |
| | aactccttaa ggaagatctc aaacatgttt atctgaaagt cccggattca tctcaatatt | 1260 |
| | gcttccccat gagtgatgga cctctcttca tgcactgtct acagagacac ttagatgatt | 1320 |
| 35 | tgtctggattc caatgcttat tcaattgctt tgataaagga acaaattggg ctggtgaaag | 1380 |
| | aagacttgga attcataaga tcttttttctg cgaatattga gcaaggattg tataaagatc | 1440 |
| 40 | tctgggaacg tgttctagat gtggcatatg aggcaaaaga tgtcatagat tcaattattg | 1500 |
| | ttcgagataa tgggtctctta catcttattt tctcacttcc cattaccaga aagaagatga | 1560 |
| | tgtttatcaa agaagaggtc tctgattttac atgagaacat ttccaagaac agagggtctca | 1620 |
| 45 | tcgttgtgaa ctctcccaag aaaccagttg agagcaagtc attgacaact gataaaataa | 1680 |
| | ttgtagggttt tgggtaggag acaaacttga tacttagaaa gctcaccagt ggaccggcag | 1740 |
| 50 | atctagatgt catttcgatc attggtatgc cgggtttagg taaaactact ttggcgtaca | 1800 |
| | aagtatacaa tgataaatca gtttctagcc atttcgacct tcgtgcatgg tgcacggctg | 1860 |
| | accaagtata tgacgagaag aagttgttgg ataaaatttt caatcaagtt agtgactcaa | 1920 |
| 55 | attcaaaaatt gagtgagaat attgatgttg ctgataaact acggaaacaa ttgtttggaa | 1980 |
| | agaggatatct tattgtctta gatgacgtgt gggatactaa tacatgggat gagctaacaa | 2040 |
| 60 | gaccttttcc tgatgggatg aaaggaagta gaattatttt gacaactcga gaaaagaaag | 2100 |
| | ttgcttttga tggaaagctc tacactgate ctcttaacct tcgattgcta agatcagaag | 2160 |
| | aaagttggga gttattagag aaaagggcat ttggaaacga gagttgccct gatgaactat | 2220 |
| 65 | tggatgttgg taaagaaata gccgaaaatt gtaaagggtc tcctttggtg gtggatctga | 2280 |
| | ttgctggaat cattgctggg agggaaaaga aaaagagtgt gtggcttgaa gttgtaaata | 2340 |

13

| | | |
|----|--|------|
| | atttgcattc ctttattttg aagaatgaag tggaagtgat gaaagttata gaaataagtt | 2400 |
| | atgaccactt acctgatcac ctgaagccat gcttgctgta ctttgcaagt gcgccgaagg | 2460 |
| 5 | actgggtaac gacaatccat gagttgaaac ttatttgggg ttttgaagga tttgtggaaa | 2520 |
| | agacagatat gaagagtctg gaagaagtgg tgaaaattta tttggatgat ttaatttcca | 2580 |
| 10 | gtagcttggt aatttgtttc aatgagatag gtgattaccc tacttgccaa cttcatgac | 2640 |
| | ttgtgcatga cttttgtttg ataaaagcaa gaaaggaaaa gttgtgtgat cggataagtt | 2700 |
| | caagtgcctc atcagatttg ttgccacgtc aaattagcat tgattatgat gatgatgaag | 2760 |
| 15 | agcacttttg gcttaatttt gtccctgttcg gttcaaataa gaaaaggcat tccggtaaac | 2820 |
| | acctctattc tttgaccata aatggagatg agctggacga ccatctttct gatacatctc | 2880 |
| 20 | atctaagaca cttgaggctt cttagaacct tgcacctgga atcctctttt atcatggtta | 2940 |
| | aagattcttt gctgaatgaa atatgcatgt tgaatcattt gaggtactta agcattggga | 3000 |
| | cagaagttaa atctctgcct ttgtctttct caaacctctg gaatctagaa atcttgtttg | 3060 |
| 25 | tggataacaa agaatcaacc ttgatactat taccgagaat ttgggatctt gtaaagttgc | 3120 |
| | aagtgtctgt cactgtctt tgttctttct ttgatatgga tgcagatgaa tcaatactga | 3180 |
| 30 | tagcagagga caciaagtta gagaacttga cagcattagg ggaactcgtg ctttcctatt | 3240 |
| | ggaaagatac agaggatatt ttcaaaaggc ttcccaatct tcaagtgcct catttcaaac | 3300 |
| | tcaaggagtc atgggattat tcaacagagc aatattgggt cccgaaattg gatttcctaa | 3360 |
| 35 | ctgaactaga aaaactcact gtagattttg aaagatcaaa caciaatgac agtgggtcct | 3420 |
| | ctgcagccat aaatcgcca tgggattttc actttccttc gagtttgaaa agattgcaat | 3480 |
| 40 | tgcattgaatt tcctctgaca tccgattcac tatcaacaat agcgagactg ctgaaccttg | 3540 |
| | aagagttgta cctttatcgt acaatcatcc atggggaaga atggaacatg ggagaagaag | 3600 |
| | acacctttga gaatctcaaa tgtttgatgt tgagtcaagt gattctttcc aagtgggagg | 3660 |
| 45 | ttggagagga atcttttccc acgcttgaga aattagaact gtcggactgt cataatcttg | 3720 |
| | aggagattcc gtctagtttt ggggatattt attccttgaa aattatcgaa cttgtaagga | 3780 |
| 50 | gccctcaact tgaaaattcc gctctcaaga ttaaggaata tgctgaagat atgaggggag | 3840 |
| | gggacgagct tcagatcctt ggccagaagg atatcccggt atttaagtag | 3890 |
| 55 | <210> 4 | |
| | <211> 1267 | |
| | <212> PRT | |
| 60 | <213> Solanum bulbocastanum | |
| 65 | <220> | |
| | <221> protein | |
| | <222> (1) .. (1267) | |

<223> Deduced Rpi-blb2 protein sequence

5

<400> 4

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1 5 10 15

10

Phe Ser Ala Leu Arg Lys Asp Ala Ala Asn Val Leu Asp Phe Leu Glu
20 25 30

15

Arg Leu Lys Asn Glu Glu Asp Gln Lys Ala Val Asp Val Asp Leu Ile
35 40 45

20

Glu Ser Leu Lys Leu Lys Leu Thr Phe Ile Cys Thr Tyr Val Gln Leu
50 55 60

25

Ser Tyr Ser Asp Leu Glu Lys Phe Glu Asp Ile Met Thr Arg Lys Arg
65 70 75 80

30

Gln Glu Val Glu Asn Leu Leu Gln Pro Ile Leu Asp Asp Asp Gly Lys
85 90 95

Asp Val Gly Cys Lys Tyr Val Leu Thr Ser Leu Ala Gly Asn Met Asp
100 105 110

35

Asp Cys Ile Ser Leu Tyr His Arg Ser Lys Ser Asp Ala Thr Met Met
115 120 125

40

Asp Glu Gln Leu Gly Phe Leu Leu Leu Asn Leu Ser His Leu Ser Lys
130 135 140

45

His Arg Ala Glu Lys Met Phe Pro Gly Val Thr Gln Tyr Glu Val Leu
145 150 155 160

50

Gln Asn Val Cys Gly Asn Ile Arg Asp Phe His Gly Leu Ile Val Asn
165 170 175

Cys Cys Ile Lys His Glu Met Val Glu Asn Val Leu Ser Leu Phe Gln
180 185 190

55

Leu Met Ala Glu Arg Val Gly Arg Phe Leu Trp Glu Asp Gln Ala Asp
195 200 205

60

Glu Asp Ser Gln Leu Ser Glu Leu Asp Glu Asp Asp Gln Asn Asp Lys
210 215 220

65

Asp Pro Gln Leu Phe Lys Leu Ala His Leu Leu Leu Lys Ile Val Pro
225 230 235 240

Thr Glu Leu Glu Val Met His Ile Cys Tyr Lys Thr Leu Lys Ala Ser

| | | | |
|----|--|-----|-----|
| | 245 | 250 | 255 |
| 5 | Thr Ser Thr Glu Ile Gly Arg Phe Ile Lys Lys Leu Leu Glu Thr Ser 260 265 270 | | |
| 10 | Pro Asp Ile Leu Arg Glu Tyr Leu Ile His Leu Gln Glu His Met Ile 275 280 285 | | |
| 15 | Thr Val Ile Thr Pro Asn Thr Ser Gly Ala Arg Asn Ile His Val Met 290 295 300 | | |
| 20 | Met Glu Phe Leu Leu Ile Ile Leu Ser Asp Met Pro Pro Lys Asp Phe 305 310 315 320 | | |
| 25 | Ile His His Asp Lys Leu Phe Asp Leu Leu Ala Arg Val Val Ala Leu 325 330 335 | | |
| 30 | Thr Arg Glu Val Ser Thr Leu Val Arg Asp Leu Glu Glu Lys Leu Arg 340 345 350 | | |
| 35 | Ile Lys Glu Ser Thr Asp Glu Thr Asn Cys Ala Thr Leu Lys Phe Leu 355 360 365 | | |
| 40 | Glu Asn Ile Glu Leu Leu Lys Glu Asp Leu Lys His Val Tyr Leu Lys 370 375 380 | | |
| 45 | Val Pro Asp Ser Ser Gln Tyr Cys Phe Pro Met Ser Asp Gly Pro Leu 385 390 395 400 | | |
| 50 | Phe Met His Leu Leu Gln Arg His Leu Asp Asp Leu Leu Asp Ser Asn 405 410 415 | | |
| 55 | Ala Tyr Ser Ile Ala Leu Ile Lys Glu Gln Ile Gly Leu Val Lys Glu 420 425 430 | | |
| 60 | Asp Leu Glu Phe Ile Arg Ser Phe Phe Ala Asn Ile Glu Gln Gly Leu 435 440 445 | | |
| 65 | Tyr Lys Asp Leu Trp Glu Arg Val Leu Asp Val Ala Tyr Glu Ala Lys 450 455 460 | | |
| | Asp Val Ile Asp Ser Ile Ile Val Arg Asp Asn Gly Leu Leu His Leu 465 470 475 480 | | |
| | Ile Phe Ser Leu Pro Ile Thr Arg Lys Lys Met Met Leu Ile Lys Glu 485 490 495 | | |
| | Glu Val Ser Asp Leu His Glu Asn Ile Ser Lys Asn Arg Gly Leu Ile 500 505 510 | | |
| | Val Val Asn Ser Pro Lys Lys Pro Val Glu Ser Lys Ser Leu Thr Thr | | |

| | 515 | 520 | 525 |
|----|--|-----|-----|
| 5 | Asp Lys Ile Ile Val Gly Phe Gly Glu Glu Thr Asn Leu Ile Leu Arg 530 535 540 | | |
| 10 | Lys Leu Thr Ser Gly Pro Ala Asp Leu Asp Val Ile Ser Ile Ile Gly 545 550 555 560 | | |
| | Met Pro Gly Leu Gly Lys Thr Thr Leu Ala Tyr Lys Val Tyr Asn Asp 565 570 575 | | |
| 15 | Lys Ser Val Ser Ser His Phe Asp Leu Arg Ala Trp Cys Thr Val Asp 580 585 590 | | |
| 20 | Gln Val Tyr Asp Glu Lys Lys Leu Leu Asp Lys Ile Phe Asn Gln Val 595 600 605 | | |
| 25 | Ser Asp Ser Asn Ser Lys Leu Ser Glu Asn Ile Asp Val Ala Asp Lys 610 615 620 | | |
| 30 | Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr Leu Ile Val Leu Asp Asp 625 630 635 640 | | |
| | Val Trp Asp Thr Asn Thr Trp Asp Glu Leu Thr Arg Pro Phe Pro Asp 645 650 655 | | |
| 35 | Gly Met Lys Gly Ser Arg Ile Ile Leu Thr Thr Arg Glu Lys Lys Val 660 665 670 | | |
| 40 | Ala Leu His Gly Lys Leu Tyr Thr Asp Pro Leu Asn Leu Arg Leu Leu 675 680 685 | | |
| 45 | Arg Ser Glu Glu Ser Trp Glu Leu Leu Glu Lys Arg Ala Phe Gly Asn 690 695 700 | | |
| 50 | Glu Ser Cys Pro Asp Glu Leu Leu Asp Val Gly Lys Glu Ile Ala Glu 705 710 715 720 | | |
| | Asn Cys Lys Gly Leu Pro Leu Val Val Asp Leu Ile Ala Gly Ile Ile 725 730 735 | | |
| 55 | Ala Gly Arg Glu Lys Lys Lys Ser Val Trp Leu Glu Val Val Asn Asn 740 745 750 | | |
| 60 | Leu His Ser Phe Ile Leu Lys Asn Glu Val Glu Val Met Lys Val Ile 755 760 765 | | |
| 65 | Glu Ile Ser Tyr Asp His Leu Pro Asp His Leu Lys Pro Cys Leu Leu 770 775 780 | | |
| | Tyr Phe Ala Ser Ala Pro Lys Asp Trp Val Thr Thr Ile His Glu Leu | | |

| | 785 | | 790 | | 795 | | 800 | | | | | | | | | |
|----|-----|------|-----|-----|-----|-----|------|------|-----|-----|-----|------|------|-----|-----|-----|
| 5 | Lys | Leu | Ile | Trp | Gly | Phe | Glu | Gly | Phe | Val | Glu | Lys | Thr | Asp | Met | Lys |
| | | | | | 805 | | | | | 810 | | | | | 815 | |
| 10 | Ser | Leu | Glu | Glu | Val | Val | Lys | Ile | Tyr | Leu | Asp | Asp | Leu | Ile | Ser | Ser |
| | | | | | 820 | | | | 825 | | | | | 830 | | |
| | Ser | Leu | Val | Ile | Cys | Phe | Asn | Glu | Ile | Gly | Asp | Tyr | Pro | Thr | Cys | Gln |
| | | | 835 | | | | | 840 | | | | | 845 | | | |
| 15 | Leu | His | Asp | Leu | Val | His | Asp | Phe | Cys | Leu | Ile | Lys | Ala | Arg | Lys | Glu |
| | | 850 | | | | | 855 | | | | | 860 | | | | |
| 20 | Lys | Leu | Cys | Asp | Arg | Ile | Ser | Ser | Ser | Ala | Pro | Ser | Asp | Leu | Leu | Pro |
| | 865 | | | | | 870 | | | | | 875 | | | | 880 | |
| 25 | Arg | Gln | Ile | Ser | Ile | Asp | Tyr | Asp | Asp | Asp | Glu | Glu | His | Phe | Gly | Leu |
| | | | | | 885 | | | | | 890 | | | | | 895 | |
| 30 | Asn | Phe | Val | Leu | Phe | Gly | Ser | Asn | Lys | Lys | Arg | His | Ser | Gly | Lys | His |
| | | | 900 | | | | | | 905 | | | | | 910 | | |
| | Leu | Tyr | Ser | Leu | Thr | Ile | Asn | Gly | Asp | Glu | Leu | Asp | Asp | His | Leu | Ser |
| | | 915 | | | | | | 920 | | | | | 925 | | | |
| 35 | Asp | Thr | Phe | His | Leu | Arg | His | Leu | Arg | Leu | Leu | Arg | Thr | Leu | His | Leu |
| | | 930 | | | | | 935 | | | | | 940 | | | | |
| 40 | Glu | Ser | Ser | Phe | Ile | Met | Val | Lys | Asp | Ser | Leu | Leu | Asn | Glu | Ile | Cys |
| | 945 | | | | | 950 | | | | | 955 | | | | 960 | |
| 45 | Met | Leu | Asn | His | Leu | Arg | Tyr | Leu | Ser | Ile | Gly | Thr | Glu | Val | Lys | Ser |
| | | | | | 965 | | | | | 970 | | | | | 975 | |
| 50 | Leu | Pro | Leu | Ser | Phe | Ser | Asn | Leu | Trp | Asn | Leu | Glu | Ile | Leu | Phe | Val |
| | | | | 980 | | | | | 985 | | | | | 990 | | |
| | Asp | Asn | Lys | Glu | Ser | Thr | Leu | Ile | Leu | Leu | Pro | Arg | Ile | Trp | Asp | Leu |
| | | | 995 | | | | | 1000 | | | | | 1005 | | | |
| 55 | Val | Lys | Leu | Gln | Val | Leu | Phe | Thr | Thr | Ala | Cys | Ser | Phe | Phe | Asp | |
| | | 1010 | | | | | 1015 | | | | | 1020 | | | | |
| 60 | Met | Asp | Ala | Asp | Glu | Ser | Ile | Leu | Ile | Ala | Glu | Asp | Thr | Lys | Leu | |
| | | 1025 | | | | | 1030 | | | | | 1035 | | | | |
| 65 | Glu | Asn | Leu | Thr | Ala | Leu | Gly | Glu | Leu | Val | Leu | Ser | Tyr | Trp | Lys | |
| | | 1040 | | | | | 1045 | | | | | 1050 | | | | |
| | Asp | Thr | Glu | Asp | Ile | Phe | Lys | Arg | Leu | Pro | Asn | Leu | Gln | Val | Leu | |

| | 1055 | 1060 | 1065 |
|----|-------------------------------------|-----------------------------|---------------------|
| 5 | His Phe Lys Leu Lys Glu Ser 1070 | Trp Asp Tyr Ser Thr 1075 | Glu Gln Tyr 1080 |
| 10 | Trp Phe Pro Lys Leu Asp Phe 1085 | Leu Thr Glu Leu Glu 1090 | Lys Leu Thr 1095 |
| 15 | Val Asp Phe Glu Arg Ser Asn 1100 | Thr Asn Asp Ser Gly 1105 | Ser Ser Ala 1110 |
| 20 | Ala Ile Asn Arg Pro Trp Asp 1115 | Phe His Phe Pro Ser 1120 | Ser Leu Lys 1125 |
| 25 | Arg Leu Gln Leu His Glu Phe 1130 | Pro Leu Thr Ser Asp 1135 | Ser Leu Ser 1140 |
| 30 | Thr Ile Ala Arg Leu Leu Asn 1145 | Leu Glu Glu Leu Tyr 1150 | Leu Tyr Arg 1155 |
| 35 | Thr Ile Ile His Gly Glu Glu 1160 | Trp Asn Met Gly Glu 1165 | Glu Asp Thr 1170 |
| 40 | Phe Glu Asn Leu Lys Cys Leu 1175 | Met Leu Ser Gln Val 1180 | Ile Leu Ser 1185 |
| 45 | Lys Trp Glu Val Gly Glu Glu 1190 | Ser Phe Pro Thr Leu 1195 | Glu Lys Leu 1200 |
| 50 | Glu Leu Ser Asp Cys His Asn 1205 | Leu Glu Glu Ile Pro 1210 | Ser Ser Phe 1215 |
| 55 | Gly Asp Ile Tyr Ser Leu Lys 1220 | Ile Ile Glu Leu Val 1225 | Arg Ser Pro 1230 |
| 60 | Gln Leu Glu Asn Ser Ala Leu 1235 | Lys Ile Lys Glu Tyr 1240 | Ala Glu Asp 1245 |
| 65 | Met Arg Gly Gly Asp Glu Leu 1250 | Gln Ile Leu Gly Gln 1255 | Lys Asp Ile 1260 |
| | Pro Leu Phe Lys 1265 | | |
| | <210> 5 | | |
| | <211> 7967 | | |
| | <212> .DNA | | |
| | <213> Solanum bulbocastanum | | |

<220>
 <221> genomic_DNA_fragment
 5 <222> (1)..(7967)
 <223> Sequence of the 7967 bp Sau3AI genomic DNA fragment of ARD 1197-1
 10 6 BAC 211 present in p211F-C12, Rpi-blb2 gene including natural r
 regulatory elements necessary for correct expression of the gene.
 The initiation codon (ATG position 1546-1548) and the termination
 codon (TAG position 5433-5435)
 15 <220>
 <221> stop_codon
 20 <222> (5433)..(5435)
 <223> Sequence of the 7967 bp Sau3AI genomic DNA fragment of ARD 1197-1
 25 6 BAC 211 present in p211F-C12, Rpi-blb2 gene including natural r
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 The initiation codon (ATG position 1546-1548) and the termination
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 30 <220>
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 35 <223> Sequence of the 7967 bp Sau3AI genomic DNA fragment of ARD 1197-1
 6 BAC 211 present in p211F-C12, Rpi-blb2 gene including natural r
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 The initiation codon (ATG position 1546-1548) and the termination
 40 codon (TAG position 5433-5435)
 <400> 5
 45 gatctagaat caccgaacct cccctcggta cagctcctcc agttctacca tgaatttcac 60
 ccactgattc ctcttcaatc gccattgcag attctctcga tctatgctca aaaaatcccg 120
 agataaaacc ctagatctgc ttcaaagtct ctgataccat gtaatttcag tgaattctaa 180
 50 ctaaacaatg gagagaatta actatttttag aaagactgat tgaaggagaa gaagagagaa 240
 aaattctata ttgaactcat gaacccaaaat gaatgaaaaa aataatgaga agaactatac 300
 55 tattacaatc tatatatctc tatttatatt ctaatctgaa gcagttaatt taactgactc 360
 taacaactag actgataggt gtacattttc tgtagtgca ctgcagtgca tttaactaac 420
 tgcttaacat aaagaatggt gttcgaactt cattcgaata gcttcaatga gaagcaaaca 480
 60 tgtgtacctg taaagacaca cagtaaaagt gttaataatg aataaatatg aataaatcaa 540
 ataataaatt aaaaataaaa acacatccaa ttaacattgg aggtcttgaa aatcgatggc 600
 65 aattaacaaa gacccttggtg aaatttaagt ctgtaattga aaatttgagt atagggtagg 660
 ggacatttga ctattttctc attttcttta tctttttcct aatttgtggc agacaagtga 720

| | | |
|----|--|------|
| | ggaggcccca ctgtaattga ttcattgcttt tgctttcttg acttttttga acaatactat | 780 |
| | gcatcatatt tgggtcttaat tttcctctg tttatttcca gaattttgag ctctatacat | 840 |
| 5 | ctaataacaa agcaagcaga ggatatatag tttcatcaac taaaaagggt agtcaactca | 900 |
| | tctaataat ttt gctactctca tctctattga agtacagtta tggaaaagta gaagtgatgt | 960 |
| 10 | aagaaaaatg aaagaacttt agtaggtag ttggatctaa caaagagaaa gggaaataaa | 1020 |
| | ttgcaggaga aagagagagg ttaaatactt actcacacca ccgatttaca acaaatcact | 1080 |
| | taattgtggt tagttaatgt atactttcac ctcatataat tattacttac ccatgataag | 1140 |
| 15 | ttgtattaat ttggtattaa tatccggtgc gggatgaattc ttaccgggtg agagggatgg | 1200 |
| | gggtggagag tgtggagtga acagaagcag atgtttttaga ttttttctaa gatgacgaaa | 1260 |
| 20 | gattcccctc actaatgaaa atatattact atacgctatt agagatagaa aggttcggta | 1320 |
| | ccagttgggtc tcgtttctg atgaacccca tttttacaag tcattttctt caattcaa | 1380 |
| | cgcaagtgt cctttatcat cttccactaa ttaagtcctc ttaagttcgc gtgaaaatag | 1440 |
| 25 | tgaattatt gattattctt atcatttcat cttctttctc ctgataaagt tttatgtact | 1500 |
| | ttttatgcat caggcttga gaacttggaa aggaaaagta gaatcatgga aaaacgaaaa | 1560 |
| 30 | gataatgaag aagcaaaca ctcattggta tgttatttga tagagtgaac tgtaaagtat | 1620 |
| | tgaattgtag atatcatgtg gctttaaaaa tttgatatgt gttatttttg caggagtc | 1680 |
| | tttctgctct tcgcaaggat gctgccaatg ttctggattt cctagagaga ttaaagaatg | 1740 |
| 35 | aagaagatca aaaggctgtt gatgtggatc tgattgaaag cctgaaattg aagctgacat | 1800 |
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| | acgtcgggtg taaatatgtc cttactagcc tcgccggtaa tatggatgac tgtataagct | 1980 |
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| | | | | | | | |
|----|-------------|-------------|-------------|-------------|--------------|-------------|------|
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| 15 | ccaagaaacc | agttgagagc | aagtcattga | caactgataa | aataattgta | ggttttgggtg | 3240 |
| | aggagacaaa | cttgatactt | agaaagctca | ccagtggacc | ggcagatcta | gatgtcattt | 3300 |
| 20 | cgatcattgg | tatgccgggt | ttaggtaaaa | ctactttggc | gtacaaagta | tacaatgata | 3360 |
| | aatcagtttc | tagccatttc | gaccttcgtg | catgggtgcac | ggtcgaccaa | gtatatgacg | 3420 |
| | agaagaagtt | gttggataaa | attttcaatc | aagttagtga | ctcaaattca | aaattgagtg | 3480 |
| 25 | agaatattga | tgttgctgat | aaactacgga | aacaattggt | tggaagagg | tatcttattg | 3540 |
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| | tagagaaaag | ggcatttgga | aacgagagtt | gccctgatga | actattggat | gttggttaaag | 3780 |
| 35 | aaatagccga | aaattgtaaa | gggcttcctt | tggtgggtgga | tctgattgct | ggaatcattg | 3840 |
| | ctgggagggg | aaagaaaaag | agtgtgtggc | ttgaagttgt | aaataatttg | cattccttta | 3900 |
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| | atattttcaa aaggcttccc aatcttcaag tgcttcattt caaactcaag gaggcatggg | 4860 |
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| 55 | gaatggaaca tgggggagga agacactttt gagaatctga aatgtgttag agccacaagc | 6480 |
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| | | |
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| 25 | aacatgatgg ggagggtaga taaaataata tatgagggcat aaaaatagga aagatatttg | 7620 |
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| 40 | <210> 6 | |
| | <211> 9949 | |
| 45 | <212> DNA | |
| | <213> Solanum bulbocastanum | |
| 50 | <220> | |
| | <221> genomic_DNA_fragment | |
| 55 | <222> (1)..(9949) | |
| | <223> Sequence of 9949 bp Sau3AI genomic DNA fragment of S. bulbocastanum 2002 BAC BlbSP39 present in pSP39-20. The genomic fragment harbours the Rpi-blb2 gene including natural elements necessary for expression. Initiation codon (ATG position 1413-1415), the termination codon (TAG position 5300-5303) | |
| 60 | | |
| 65 | <220> | |
| | <221> start_codon | |
| | <222> (1413)..(1415) | |

5 <223> Sequence of 9949 bp Sau3AI genomic DNA fragment of *S. bulbocastan*
 um 2002 BAC BlbSP39 present in pSP39-20. The genomic fragment har
 bours the Rpi-blb2 gene including natural elements necessary for
 expression. Initiation codon (ATG position 1413-1415), the termi
 nation codon (TAG position 5300-5303)

10 <220>
 <221> stop_codon
 <222> (5300)..(5303)

15 <223> Sequence of 9949 bp Sau3AI genomic DNA fragment of *S. bulbocastan*
 um 2002 BAC BlbSP39 present in pSP39-20. The genomic fragment har
 bours the Rpi-blb2 gene including natural elements necessary for
 expression. Initiation codon (ATG position 1413-1415), the termi
 20 nation codon (TAG position 5300-5303)

25 <400> 6
 gatctgcttc aatgctctg ataccatgta atttcagtga attctaacta aacaatggag 60
 agaattaact attttagaaa gactgattga aggagaagaa gagagaaaaa ttctatattg 120
 aactcatgaa ccaaaatgaa tgaaaaaaat aatgagaaga actatactat tacaatctat 180
 30 atatctctat ttatattcta atctgaagca gttaatttaa ctgactctaa caactagact 240
 gataggtgta cattttctgt tagtgcactg cagtgcattt aactaactgc ttaacataaa 300
 35 gaatgttggt cgaacttcat tcgaatagct tcaatgagaa gcaaacatgt gtacctgtaa 360
 agacacacag taaaagtgtt aataatgaat aaatatgaat aaatcaaata ataaattaaa 420
 aataaaaaca catccaatta acattggagg tcttgaaaat cgatggtaat taacaaagac 480
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 ttttctcatt ttctttatct ttttctaat ttgtggcaga caagtgagga ggccccactg 600
 45 taattgattc atgcttttgc tttcttgact ttttggaaca atactatgca tcatatttgg 660
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| | | |
|----|---|------|
| | tattcttatc atttcatctt ctttctcctg ataaagtttt atgtactttt tatgcatcag | 1380 |
| | gtcttgagaa cttggaaagg aaaagtagaa tcatggaaaa acgaaaagat aatgaagaag | 1440 |
| 5 | caaacaactc attggtatgt tatttgatag agtgaactgt aaagtattga attgtagata | 1500 |
| | tcatgtggct ttaaaaattt gatatgtgtt attttggcag gagtcatttt ctgctcttcg | 1560 |
| 10 | caaggatgct gccaatgttc tggatttcct agagagatta aagaatgaag aagatcaaaa | 1620 |
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| | atatgtcctt actagcctcg ccggtaatat ggatgactgt ataagcttgt atcatcgctc | 1860 |
| 20 | taaatcagat gccaccatga tggatgagca attgggcttc ctctcttga atctctctca | 1920 |
| | tctatccaag catcgctgctg aaaagatgtt tcctggagtg actcaatatg aggttcttca | 1980 |
| | gaatgtatgt ggcaacataa gagatttcca tggattgata gtgaattgtt gcattaagca | 2040 |
| 25 | tgagatgggt gagaatgtct tatctctgtt tcaactgatg gctgagagag taggacgctt | 2100 |
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| | tggacgcttc attaagaagc tcctggaaac ctctccggac attctcagag aatatctgat | 2340 |
| 35 | tcacttacia gagcatatga taactgttat taccctaac acttcagggg ctcgaaacat | 2400 |
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| | | |
|----|--|------|
| | tgacttttct gagtttcttt tagaaaactc agaagttttt aacaaaaatt atagttttta | 5460 |
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| 10 | gcttataagc actcatgact tccttttctc gaacattcaa ccaacgtagg ctgaaatccc | 5700 |
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| | gcgatttcaa gcctgatgca tatggttagt gtggctagag cagacaggat gtattacctg | 6660 |
| | gatatctacc aagacgaatc cacaatcagt tttatgtcaa gcaatacatg aagtaactcc | 6720 |
| 45 | cgatagaaca gtaaaagcaa gatgtgtagg tgtatctcga ctctaagaga ttgtacattc | 6780 |
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| 65 | ctgacaatct ccacaagtct tagtcaactt gtaatatgaa tattagccag gtagacgtac | 7380 |
| | atatttacia aattgagttt cctatataat atggtttgaa ggaatgaaac atgatgggga | 7440 |

| | | |
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| 30 | tgaaataaca atatactata ctatgttaaa gtatttttta tagttaaaat ttctctagag | 8340 |
| | tacttgattc tacatacaaa tactaatttc gtaaaaaaat taatattgaa tttcttcatt | 8400 |
| | gtttctttat tattaaatta gtttataata actaaactaa ggtaataaga ccttagttta | 8460 |
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29

| | | |
|----|--|------|
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| | aagaattccc tttttgtttc tatttacttc tactcccaa atgtatttca attgacccaa | 9900 |
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| 30 | <221> CDS | |
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| | <223> Mil.1 from tomato | |
| 35 | | |
| | <400> 7 | |
| 40 | atg gaa aaa cga aaa gat aat gaa gaa gca aac aac tca ttg gtg cta Met Glu Lys Arg Lys Asp Asn Glu Glu Ala Asn Asn Ser Leu Val Leu | 48 |
| | 1 5 10 15 | |
| | ttt tct gct ctt agc aag gac att gcc gat gtt ctg gtt ttc cta gag | 96 |
| 45 | Phe Ser Ala Leu Ser Lys Asp Ile Ala Asp Val Leu Val Phe Leu Glu | |
| | 20 25 30 | |
| | aat gag gaa aat caa aaa gct ctt gac aaa gat caa gtt gaa aag ata | 144 |
| | Asn Glu Glu Asn Gln Lys Ala Leu Asp Lys Asp Gln Val Glu Lys Ile | |
| 50 | 35 40 45 | |
| | aaa ttg aaa atg gca ttt att tgt aca tat gtt cag ctt tct tgt tcc | 192 |
| | Lys Leu Lys Met Ala Phe Ile Cys Thr Tyr Val Gln Leu Ser Cys Ser | |
| | 50 55 60 | |
| 55 | gat ttt gag cag ttt gaa gat ata atg act aga aaa aga caa gag gtt | 240 |
| | Asp Phe Glu Gln Phe Glu Asp Ile Met Thr Arg Lys Arg Gln Glu Val | |
| | 65 70 75 80 | |
| | gag aat ctg ctt caa cca ctt ttg gat gat gat gtc ttt act agc ctc | 288 |
| 60 | Glu Asn Leu Leu Gln Pro Leu Leu Asp Asp Asp Val Phe Thr Ser Leu | |
| | 85 90 95 | |
| | acc agt aat atg gat gac tgt atc agc ttg tat cat cgt tct tat aaa | 336 |
| | Thr Ser Asn Met Asp Asp Cys Ile Ser Leu Tyr His Arg Ser Tyr Lys | |
| 65 | 100 105 110 | |
| | tca gat gcc atc atg atg gat gag caa ttg gac ttc ctc ctc ttg aat | 384 |
| | Ser Asp Ala Ile Met Met Asp Glu Gln Leu Asp Phe Leu Leu Leu Asn | |

30

| | 115 | 120 | 125 | |
|----|---|------|-----|--|
| 5 | ctc tat cat cta tcc aag cat cac gct gaa aag ata ttt cct gga gtg Leu Tyr His Leu Ser Lys His His Ala Glu Lys Ile Phe Pro Gly Val 130 135 140 | 432 | | |
| 10 | act caa tat gaa gtt ctt cag aat ata tgt ggc aac ata aga gat ttc Thr Gln Tyr Glu Val Leu Gln Asn Ile Cys Gly Asn Ile Arg Asp Phe 145 150 155 160 | 480 | | |
| 15 | cat ggg ttg ata gtg aat ggt tgc att aag cat gag atg gtt gag aat His Gly Leu Ile Val Asn Gly Cys Ile Lys His Glu Met Val Glu Asn 165 170 175 | 528 | | |
| 20 | gtc ttr cct ctg ttt caa ctc atg gct gac aga gta gga cac ttc ctt Val Xaa Pro Leu Phe Gln Leu Met Ala Asp Arg Val Gly His Phe Leu 180 185 190 | 576 | | |
| 25 | tggt gat gat cag act gat gaa gac tct cga ctc tcc gag cta gat gag Trp Asp Asp Gln Thr Asp Glu Asp Ser Arg Leu Ser Glu Leu Asp Glu 195 200 205 | 624 | | |
| 30 | gat gaa caa aat gat aga gac tct cga ctt ttc aag cta gca cat cta Asp Glu Gln Asn Asp Arg Asp Ser Arg Leu Phe Lys Leu Ala His Leu 210 215 220 | 672 | | |
| 35 | ctc ttg aag atc gtt ccg gtt gaa ctg gag gtt ata cac ata tgt tat Leu Leu Lys Ile Val Pro Val Glu Leu Glu Val Ile His Ile Cys Tyr 225 230 235 240 | 720 | | |
| 40 | aca aac ttg aaa gct tca act tca gct gaa gtt gga ctc ttc att aag Thr Asn Leu Lys Ala Ser Thr Ser Ala Glu Val Gly Leu Phe Ile Lys 245 250 255 | 768 | | |
| 45 | cag ctt cta gaa acc tct cca gat att ctg agg gaa tat cta att cct Gln Leu Leu Glu Thr Ser Pro Asp Ile Leu Arg Glu Tyr Leu Ile Pro 260 265 270 | 816 | | |
| 50 | ctg caa gag cac atg gta act gtt att acc cct agc act tca ggg gct Leu Gln Glu His Met Val Thr Val Ile Thr Pro Ser Thr Ser Gly Ala 275 280 285 | 864 | | |
| 55 | cga aac att cat gtc atg atg gaa ttc cta tta ctt att ctt tct gat Arg Asn Ile His Val Met Met Glu Phe Leu Leu Ile Leu Ser Asp 290 295 300 | 912 | | |
| 60 | atg ccc aag gac ttt att cat cat gac aaa ctt ttt gat ctc ttg gat Met Pro Lys Asp Phe Ile His His Asp Lys Leu Phe Asp Leu Leu Asp 305 310 315 320 | 960 | | |
| 65 | cgt gtc gga gta ctt acc agg gag gta tca act ctt gta cgt gac ttg Arg Val Gly Val Leu Thr Arg Glu Val Ser Thr Leu Val Arg Asp Leu 325 330 335 | 1008 | | |
| 70 | gaa gag gaa cca agg aat aaa gag ggt aat aac caa aca aat tgt gca Glu Glu Glu Pro Arg Asn Lys Glu Gly Asn Asn Gln Thr Asn Cys Ala 340 345 350 | 1056 | | |
| 75 | acc cta gac ttg ctg gaa aat att gaa ctc ctc aag aaa gat ctc aaa Thr Leu Asp Leu Leu Glu Asn Ile Glu Leu Leu Lys Lys Asp Leu Lys 355 360 365 | 1104 | | |
| 80 | cat gtt tat ctg aaa gcc ctg gat tca tct caa tgt tgc ttc ccc atg His Val Tyr Leu Lys Ala Leu Asp Ser Ser Gln Cys Cys Phe Pro Met 370 375 380 | 1152 | | |
| 85 | agt gat gga cca ctc ttc atg cat ctt cta cac ata cac tta aat gat Ser Asp Gly Pro Leu Phe Met His Leu Leu His Ile His Leu Asn Asp 385 390 395 | 1200 | | |

31

| | 385 | 390 | 395 | 400 | |
|----|--|-----|-----|-----|------|
| 5 | ttg tta gat tct aat gct tat tca att gct ttg ata aag gaa gaa atc Leu Leu Asp Ser Asn Ala Tyr Ser Ile Ala Leu Ile Lys Glu Glu Ile | 405 | 410 | 415 | 1248 |
| 10 | gag ctg gtg aag caa gac ctg aaa ttc ata aga tca ttc ttt gtg gat Glu Leu Val Lys Gln Asp Leu Lys Phe Ile Arg Ser Phe Phe Val Asp | 420 | 425 | 430 | 1296 |
| 15 | gct gag caa gga ttg tat aaa gat ctc tgg gca cgt gtt cta gat gtg Ala Glu Gln Gly Leu Tyr Lys Asp Leu Trp Ala Arg Val Leu Asp Val | 435 | 440 | 445 | 1344 |
| 20 | gct tat gag gca aaa gat gtc ata gat tca att att gtt cga gat aat Ala Tyr Glu Ala Lys Asp Val Ile Asp Ser Ile Ile Val Arg Asp Asn | 450 | 455 | 460 | 1392 |
| 25 | ggc ctc tta cat ctt att ttc tca ctt ccc att acc ata aag aag atc Gly Leu Leu His Leu Ile Phe Ser Leu Pro Ile Thr Ile Lys Lys Ile | 465 | 470 | 475 | 1440 |
| 30 | aaa ctt atc aaa gaa gag atc tct gct tta gat gag aac att ccc aag Lys Leu Ile Lys Glu Glu Ile Ser Ala Leu Asp Glu Asn Ile Pro Lys | 485 | 490 | 495 | 1488 |
| 35 | gac aga ggt cta atc gtt gtg aac tct ccc aag aaa cca gtt gag aga Asp Arg Gly Leu Ile Val Val Asn Ser Pro Lys Lys Pro Val Glu Arg | 500 | 505 | 510 | 1536 |
| 40 | aag tca ttg aca act gat aaa ata act gta ggt ttt gag gag gaa aca Lys Ser Leu Thr Thr Asp Lys Ile Thr Val Gly Phe Glu Glu Glu Thr | 515 | 520 | 525 | 1584 |
| 45 | aac ttg ata ctt aga aag ctc acc agt gga tcg gca gat cta gat gtc Asn Leu Ile Leu Arg Lys Leu Thr Ser Gly Ser Ala Asp Leu Asp Val | 530 | 535 | 540 | 1632 |
| 50 | att tcg atc act ggt atg ccg ggt tca ggt aaa act act ttg gca tac Ile Ser Ile Thr Gly Met Pro Gly Ser Gly Lys Thr Thr Leu Ala Tyr | 545 | 550 | 555 | 1680 |
| 55 | aaa gta tac aat gat aag tca gtt tct agc cgt ttc gac ctt cgt gca Lys Val Tyr Asn Asp Lys Ser Val Ser Ser Arg Phe Asp Leu Arg Ala | 565 | 570 | 575 | 1728 |
| 60 | tgg tgc acg gtc gac caa gga tgt gat gag aag aag ttg ttg aat aca Trp Cys Thr Val Asp Gln Gly Cys Asp Glu Lys Lys Leu Leu Asn Thr | 580 | 585 | 590 | 1776 |
| 65 | att ttc agt caa gtt agt gac tca gat tca aaa ttg agt gag aat att Ile Phe Ser Gln Val Ser Asp Ser Asp Ser Lys Leu Ser Glu Asn Ile | 595 | 600 | 605 | 1824 |
| 70 | gat gtt gct gat aaa tta cgg aaa caa ctg ttt gga aag agg tat ctt Asp Val Ala Asp Lys Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr Leu | 610 | 615 | 620 | 1872 |
| 75 | att gtc tta gat gac gtg tgg gat act act aca tgg gat gag tta aca Ile Val Leu Asp Asp Val Trp Asp Thr Thr Thr Trp Asp Glu Leu Thr | 625 | 630 | 635 | 1920 |
| 80 | aga cct ttt cct gaa tct aag aaa gga agt agg att att ttg aca act Arg Pro Phe Pro Glu Ser Lys Lys Gly Ser Arg Ile Ile Leu Thr Thr | 645 | 650 | 655 | 1968 |
| 85 | cgg gaa aag gaa gtg gct ttg cat gga aag ctg aac act gat cct ctt Arg Glu Lys Glu Val Ala Leu His Gly Lys Leu Asn Thr Asp Pro Leu | | | | 2016 |

| | 660 | 665 | 670 | |
|----|---|------|-----|--|
| 5 | gac ctt cga ttg cta aga cca gat gaa agt tgg gaa cta tta gag aaa Asp Leu Arg Leu Leu Arg Pro Asp Glu Ser Trp Glu Leu Leu Glu Lys 675 680 685 | 2064 | | |
| 10 | agg gca ttt ggg aat gag agt tgc cct gat gaa cta tta gat gtc ggt Arg Ala Phe Gly Asn Glu Ser Cys Pro Asp Glu Leu Leu Asp Val Gly 690 695 700 | 2112 | | |
| 15 | aaa gaa ata gcc gaa aat tgt aaa ggg ctt cct ttg gtg gct gat ctg Lys Glu Ile Ala Glu Asn Cys Lys Gly Leu Pro Leu Val Ala Asp Leu 705 710 715 720 | 2160 | | |
| 20 | att gct gga gtc att gct ggg agg gaa aag aaa agg agt gtg tgg ctt Ile Ala Gly Val Ile Ala Gly Arg Glu Lys Lys Arg Ser Val Trp Leu 725 730 735 | 2208 | | |
| 25 | gaa gtt caa agt agt ttg agt tct ttt att ttg aac agt gaa gtg gaa Glu Val Gln Ser Ser Leu Ser Ser Phe Ile Leu Asn Ser Glu Val Glu 740 745 750 | 2256 | | |
| 30 | gtg atg aaa gtt ata gaa tta agt tat gac cat tta cca cat cac ctc Val Met Lys Val Ile Glu Leu Ser Tyr Asp His Leu Pro His His Leu 755 760 765 | 2304 | | |
| 35 | aag cca tgc ttg ctg tat ttt gca agt ttt ccg aag gac act tca ttg Lys Pro Cys Leu Leu Tyr Phe Ala Ser Phe Pro Lys Asp Thr Ser Leu 770 775 780 | 2352 | | |
| 40 | aca atc tat gag ttg aat gtt tat ttc ggt gct gaa gga ttt gtg gga Thr Ile Tyr Glu Leu Asn Val Tyr Phe Gly Ala Glu Gly Phe Val Gly 785 790 795 800 | 2400 | | |
| 45 | aag acg gag atg aac agt atg gaa gaa gtg gtg aag att tat atg gat Lys Thr Glu Met Asn Ser Met Glu Glu Val Val Lys Ile Tyr Met Asp 805 810 815 | 2448 | | |
| 50 | gat tta att tac agt agc ttg gta att tgt ttc aat gag ata ggt tat Asp Leu Ile Tyr Ser Ser Leu Val Ile Cys Phe Asn Glu Ile Gly Tyr 820 825 830 | 2496 | | |
| 55 | gca ctg aat ttc caa att cat gat ctt gtg cat gac ttt tgt ttg ata Ala Leu Asn Phe Gln Ile His Asp Leu Val His Asp Phe Cys Leu Ile 835 840 845 | 2544 | | |
| 60 | aaa gca aga aag gaa aat ttg ttt gat cag ata aga tca agt gct cca Lys Ala Arg Lys Glu Asn Leu Phe Asp Gln Ile Arg Ser Ser Ala Pro 850 855 860 | 2592 | | |
| 65 | tca gat ttg ttg cct cgt caa att acc att gat tgt gat gag gag gag Ser Asp Leu Leu Pro Arg Gln Ile Thr Ile Asp Cys Asp Glu Glu Glu 865 870 875 880 | 2640 | | |
| 70 | cac ttt ggg ctt aat ttt gtc atg ttc gat tca aat aag aaa agg cat His Phe Gly Leu Asn Phe Val Met Phe Asp Ser Asn Lys Lys Arg His 885 890 895 | 2688 | | |
| 75 | tct ggt aaa cac ctc tat tct ttg agg ata att gga gac cag ctg gat Ser Gly Lys His Leu Tyr Ser Leu Arg Ile Ile Gly Asp Gln Leu Asp 900 905 910 | 2736 | | |
| 80 | gac agt gtt tct gat gca ttt cac cta aga cac ttg agg ctt ctt aga Asp Ser Val Ser Asp Ala Phe His Leu Arg His Leu Arg Leu Leu Arg 915 920 925 | 2784 | | |
| 85 | gtg ttg gac ctg cat acg tct ttt atc atg gtg aaa gat tct ttg ctg Val Leu Asp Leu His Thr Ser Phe Ile Met Val Lys Asp Ser Leu Leu | 2832 | | |

| | 930 | 935 | 940 | |
|----|---|------|-----|--|
| 5 | aat gaa ata tgc atg ttg aat cat ttg agg tac tta tcc att gac aca Asn Glu Ile Cys Met Leu Asn His Leu Arg Tyr Leu Ser Ile Asp Thr 945 950 955 960 | 2880 | | |
| 10 | caa gtt aaa tat ctg cct ttg tct ttc tca aac ctc tgg aat cta gaa Gln Val Lys Tyr Leu Pro Leu Ser Phe Ser Asn Leu Trp Asn Leu Glu 965 970 975 | 2928 | | |
| 15 | agc ctg ttt gtg tct acc aac aga tca atc ttg gta cta tta ccg aga Ser Leu Phe Val Ser Thr Asn Arg Ser Ile Leu Val Leu Leu Pro Arg 980 985 990 | 2976 | | |
| 20 | att ttg gat ctt gta aag ttg cga gtg ctg tcc gtg gat gct tgt tct Ile Leu Asp Leu Val Lys Leu Arg Val Leu Ser Val Asp Ala Cys Ser 995 1000 1005 | 3024 | | |
| 25 | ttc ttt gat atg gat gca gat gaa tca ata ttg ata gca gag gac Phe Phe Asp Met Asp Ala Asp Glu Ser Ile Leu Ile Ala Glu Asp 1010 1015 1020 | 3069 | | |
| 30 | aca aag tta gag aac ttg aga ata tta acg gaa ctg ttg att tcc Thr Lys Leu Glu Asn Leu Arg Ile Leu Thr Glu Leu Leu Ile Ser 1025 1030 1035 | 3114 | | |
| 35 | tat tcg aaa gat aca aag aat att ttc aaa agg ttt ccc aat ctt Tyr Ser Lys Asp Thr Lys Asn Ile Phe Lys Arg Phe Pro Asn Leu 1040 1045 1050 | 3159 | | |
| 40 | cag ttg ctt tca ttt gaa ctc aag gag tca tgg gat tat tca aca Gln Leu Leu Ser Phe Glu Leu Lys Glu Ser Trp Asp Tyr Ser Thr 1055 1060 1065 | 3204 | | |
| 45 | gag caa cat tgg ttc tcg gaa ttg gat ttc cta act gaa cta gaa Glu Gln His Trp Phe Ser Glu Leu Asp Phe Leu Thr Glu Leu Glu 1070 1075 1080 | 3249 | | |
| 50 | aca ctc tct gta ggt ttt aaa agt tca aac aca aac gat agt ggg Thr Leu Ser Val Gly Phe Lys Ser Ser Asn Thr Asn Asp Ser Gly 1085 1090 1095 | 3294 | | |
| 55 | tcc tct gta gcg aca aat cgg ccg tgg gat ttt cac ttc cct tca Ser Ser Val Ala Thr Asn Arg Pro Trp Asp Phe His Phe Pro Ser 1100 1105 1110 | 3339 | | |
| 60 | aat ttg aaa ata ctg tgg ttg cgt gaa ttt ccg ctg aca tcc gat Asn Leu Lys Ile Leu Trp Leu Arg Glu Phe Pro Leu Thr Ser Asp 1115 1120 1125 | 3384 | | |
| 65 | tca cta tca aca ata gcg aga ctg ccc aac ctt gaa gag ttg tcc Ser Leu Ser Thr Ile Ala Arg Leu Pro Asn Leu Glu Glu Leu Ser 1130 1135 1140 | 3429 | | |
| 70 | ctt tat cat aca atc atc cat gga gaa gaa tgg aac atg ggg gag Leu Tyr His Thr Ile Ile His Gly Glu Glu Trp Asn Met Gly Glu 1145 1150 1155 | 3474 | | |
| 75 | gaa gac acc ttt gag aat ctc aaa ttt ttg aac ttc aat caa gtt Glu Asp Thr Phe Glu Asn Leu Lys Phe Leu Asn Phe Asn Gln Val 1160 1165 1170 | 3519 | | |
| 80 | agt att tcc aag tgg gag gtt gga gag gaa tcc ttc ccc aat ctt Ser Ile Ser Lys Trp Glu Val Gly Glu Glu Ser Phe Pro Asn Leu 1175 1180 1185 | 3564 | | |
| 85 | gag aaa tta aaa ctg cgg gga tgt cat aag cta gag gag att cca Glu Lys Leu Lys Leu Arg Gly Cys His Lys Leu Glu Glu Ile Pro 1190 1195 1200 | 3609 | | |

| | 1190 | 1195 | 1200 | |
|----|--|--|------------------------------------|------|
| 5 | cct agt ttt gga gat att tat Pro Ser Phe Gly Asp Ile Tyr 1205 | tca ttg aaa tct atc Ser Leu Lys Ser Ile 1210 | aaa att gta Lys Ile Val 1215 | 3654 |
| 10 | aag agt cct caa ctt gaa gat Lys Ser Pro Gln Leu Glu Asp 1220 | tct gct ctc aaa att Ser Ala Leu Lys Ile 1225 | aag gaa tac Lys Glu Tyr 1230 | 3699 |
| 15 | gct gaa gat atg agg gga ggg Ala Glu Asp Met Arg Gly Gly 1235 | gac gag ctt cag atc Asp Glu Leu Gln Ile 1240 | ctt ggc caa Leu Gly Gln 1245 | 3744 |
| 20 | aag aat atc ccc tta ttt aag tag Lys Asn Ile Pro Leu Phe Lys 1250 | | | 3768 |
| 25 | <210> 8 | | | |
| | <211> 1255 | | | |
| | <212> PRT | | | |
| 30 | <213> Lycopersicon lycopersicum | | | |
| 35 | <220> | | | |
| | <221> misc_feature | | | |
| | <222> (178)..(178) | | | |
| | <223> The 'Xaa' at location 178 stands for Leu. | | | |
| | <400> 8 | | | |
| 40 | Met Glu Lys Arg Lys Asp Asn Glu Glu Ala Asn Asn Ser Leu Val Leu 1 5 10 15 | | | |
| 45 | Phe Ser Ala Leu Ser Lys Asp Ile Ala Asp Val Leu Val Phe Leu Glu 20 25 30 | | | |
| 50 | Asn Glu Glu Asn Gln Lys Ala Leu Asp Lys Asp Gln Val Glu Lys Ile 35 40 45 | | | |
| 55 | Lys Leu Lys Met Ala Phe Ile Cys Thr Tyr Val Gln Leu Ser Cys Ser 50 55 60 | | | |
| 60 | Asp Phe Glu Gln Phe Glu Asp Ile Met Thr Arg Lys Arg Gln Glu Val 65 70 75 80 | | | |
| 65 | Glu Asn Leu Leu Gln Pro Leu Leu Asp Asp Asp Val Phe Thr Ser Leu 85 90 95 | | | |
| | Thr Ser Asn Met Asp Asp Cys Ile Ser Leu Tyr His Arg Ser Tyr Lys 100 105 110 | | | |
| | Ser Asp Ala Ile Met Met Asp Glu Gln Leu Asp Phe Leu Leu Leu Asn | | | |

35

| | 115 | 120 | 125 |
|----|--|-----|-----|
| 5 | Leu Tyr His Leu Ser Lys His His Ala Glu Lys Ile Phe Pro Gly Val 130 135 140 | | |
| 10 | Thr Gln Tyr Glu Val Leu Gln Asn Ile Cys Gly Asn Ile Arg Asp Phe 145 150 155 160 | | |
| 15 | His Gly Leu Ile Val Asn Gly Cys Ile Lys His Glu Met Val Glu Asn 165 170 175 | | |
| 20 | Val Xaa Pro Leu Phe Gln Leu Met Ala Asp Arg Val Gly His Phe Leu 180 185 190 | | |
| 25 | Trp Asp Asp Gln Thr Asp Glu Asp Ser Arg Leu Ser Glu Leu Asp Glu 195 200 205 | | |
| 30 | Asp Glu Gln Asn Asp Arg Asp Ser Arg Leu Phe Lys Leu Ala His Leu 210 215 220 | | |
| 35 | Leu Leu Lys Ile Val Pro Val Glu Leu Glu Val Ile His Ile Cys Tyr 225 230 235 240 | | |
| 40 | Thr Asn Leu Lys Ala Ser Thr Ser Ala Glu Val Gly Leu Phe Ile Lys 245 250 255 | | |
| 45 | Gln Leu Leu Glu Thr Ser Pro Asp Ile Leu Arg Glu Tyr Leu Ile Pro 260 265 270 | | |
| 50 | Leu Gln Glu His Met Val Thr Val Ile Thr Pro Ser Thr Ser Gly Ala 275 280 285 | | |
| 55 | Arg Asn Ile His Val Met Met Glu Phe Leu Leu Leu Ile Leu Ser Asp 290 295 300 | | |
| 60 | Met Pro Lys Asp Phe Ile His His Asp Lys Leu Phe Asp Leu Leu Asp 305 310 315 320 | | |
| 65 | Arg Val Gly Val Leu Thr Arg Glu Val Ser Thr Leu Val Arg Asp Leu 325 330 335 | | |
| 70 | Glu Glu Glu Pro Arg Asn Lys Glu Gly Asn Asn Gln Thr Asn Cys Ala 340 345 350 | | |
| 75 | Thr Leu Asp Leu Leu Glu Asn Ile Glu Leu Leu Lys Lys Asp Leu Lys 355 360 365 | | |
| 80 | His Val Tyr Leu Lys Ala Leu Asp Ser Ser Gln Cys Cys Phe Pro Met 370 375 380 | | |
| 85 | Ser Asp Gly Pro Leu Phe Met His Leu Leu His Ile His Leu Asn Asp | | |

| | 385 | 390 | 395 | 400 |
|----|--|-----|-----|-----|
| 5 | Leu Leu Asp Ser Asn Ala Tyr Ser Ile Ala Leu Ile Lys Glu Glu Ile 405 410 415 | | | |
| 10 | Glu Leu Val Lys Gln Asp Leu Lys Phe Ile Arg Ser Phe Phe Val Asp 420 425 430 | | | |
| 15 | Ala Glu Gln Gly Leu Tyr Lys Asp Leu Trp Ala Arg Val Leu Asp Val 435 440 445 | | | |
| 20 | Ala Tyr Glu Ala Lys Asp Val Ile Asp Ser Ile Ile Val Arg Asp Asn 450 455 460 | | | |
| 25 | Gly Leu Leu His Leu Ile Phe Ser Leu Pro Ile Thr Ile Lys Lys Ile 465 470 475 480 | | | |
| 30 | Lys Leu Ile Lys Glu Glu Ile Ser Ala Leu Asp Glu Asn Ile Pro Lys 485 490 495 | | | |
| 35 | Asp Arg Gly Leu Ile Val Val Asn Ser Pro Lys Lys Pro Val Glu Arg 500 505 510 | | | |
| 40 | Lys Ser Leu Thr Thr Asp Lys Ile Thr Val Gly Phe Glu Glu Glu Thr 515 520 525 | | | |
| 45 | Asn Leu Ile Leu Arg Lys Leu Thr Ser Gly Ser Ala Asp Leu Asp Val 530 535 540 | | | |
| 50 | Ile Ser Ile Thr Gly Met Pro Gly Ser Gly Lys Thr Thr Leu Ala Tyr 545 550 555 560 | | | |
| 55 | Lys Val Tyr Asn Asp Lys Ser Val Ser Ser Arg Phe Asp Leu Arg Ala 565 570 575 | | | |
| 60 | Trp Cys Thr Val Asp Gln Gly Cys Asp Glu Lys Lys Leu Leu Asn Thr 580 585 590 | | | |
| 65 | Ile Phe Ser Gln Val Ser Asp Ser Asp Ser Lys Leu Ser Glu Asn Ile 595 600 605 | | | |
| 70 | Asp Val Ala Asp Lys Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr Leu 610 615 620 | | | |
| 75 | Ile Val Leu Asp Asp Val Trp Asp Thr Thr Thr Trp Asp Glu Leu Thr 625 630 635 640 | | | |
| 80 | Arg Pro Phe Pro Glu Ser Lys Lys Gly Ser Arg Ile Ile Leu Thr Thr 645 650 655 | | | |
| 85 | Arg Glu Lys Glu Val Ala Leu His Gly Lys Leu Asn Thr Asp Pro Leu | | | |

660

665

670

5 Asp Leu Arg Leu Leu Arg Pro Asp Glu Ser Trp Glu Leu Leu Glu Lys
 675 680 685

10 Arg Ala Phe Gly Asn Glu Ser Cys Pro Asp Glu Leu Leu Asp Val Gly
 690 695 700

15 Lys Glu Ile Ala Glu Asn Cys Lys Gly Leu Pro Leu Val Ala Asp Leu
 705 710 715 720

20 Ile Ala Gly Val Ile Ala Gly Arg Glu Lys Lys Arg Ser Val Trp Leu
 725 730 735

25 Glu Val Gln Ser Ser Leu Ser Ser Phe Ile Leu Asn Ser Glu Val Glu
 740 745 750

30 Val Met Lys Val Ile Glu Leu Ser Tyr Asp His Leu Pro His His Leu
 755 760 765

35 Lys Pro Cys Leu Leu Tyr Phe Ala Ser Phe Pro Lys Asp Thr Ser Leu
 770 775 780

40 Thr Ile Tyr Glu Leu Asn Val Tyr Phe Gly Ala Glu Gly Phe Val Gly
 785 790 795 800

45 Lys Thr Glu Met Asn Ser Met Glu Glu Val Val Lys Ile Tyr Met Asp
 805 810 815

50 Asp Leu Ile Tyr Ser Ser Leu Val Ile Cys Phe Asn Glu Ile Gly Tyr
 820 825 830

55 Ala Leu Asn Phe Gln Ile His Asp Leu Val His Asp Phe Cys Leu Ile
 835 840 845

60 Lys Ala Arg Lys Glu Asn Leu Phe Asp Gln Ile Arg Ser Ser Ala Pro
 850 855 860

65 Ser Asp Leu Leu Pro Arg Gln Ile Thr Ile Asp Cys Asp Glu Glu Glu
 865 870 875 880

70 His Phe Gly Leu Asn Phe Val Met Phe Asp Ser Asn Lys Lys Arg His
 885 890 895

75 Ser Gly Lys His Leu Tyr Ser Leu Arg Ile Ile Gly Asp Gln Leu Asp
 900 905 910

80 Asp Ser Val Ser Asp Ala Phe His Leu Arg His Leu Arg Leu Leu Arg
 915 920 925

Val Leu Asp Leu His Thr Ser Phe Ile Met Val Lys Asp Ser Leu Leu

| | 930 | 935 | 940 |
|----|--|-----|-----|
| 5 | Asn Glu Ile Cys Met Leu Asn His Leu Arg Tyr Leu Ser Ile Asp Thr 945 950 955 960 | | |
| 10 | Gln Val Lys Tyr Leu Pro Leu Ser Phe Ser Asn Leu Trp Asn Leu Glu 965 970 975 | | |
| | Ser Leu Phe Val Ser Thr Asn Arg Ser Ile Leu Val Leu Leu Pro Arg 980 985 990 | | |
| 15 | Ile Leu Asp Leu Val Lys Leu Arg Val Leu Ser Val Asp Ala Cys Ser 995 1000 1005 | | |
| 20 | Phe Phe Asp Met Asp Ala Asp Glu Ser Ile Leu Ile Ala Glu Asp 1010 1015 1020 | | |
| 25 | Thr Lys Leu Glu Asn Leu Arg Ile Leu Thr Glu Leu Leu Ile Ser 1025 1030 1035 | | |
| 30 | Tyr Ser Lys Asp Thr Lys Asn Ile Phe Lys Arg Phe Pro Asn Leu 1040 1045 1050 | | |
| | Gln Leu Leu Ser Phe Glu Leu Lys Glu Ser Trp Asp Tyr Ser Thr 1055 1060 1065 | | |
| 35 | Glu Gln His Trp Phe Ser Glu Leu Asp Phe Leu Thr Glu Leu Glu 1070 1075 1080 | | |
| 40 | Thr Leu Ser Val Gly Phe Lys Ser Ser Asn Thr Asn Asp Ser Gly 1085 1090 1095 | | |
| 45 | Ser Ser Val Ala Thr Asn Arg Pro Trp Asp Phe His Phe Pro Ser 1100 1105 1110 | | |
| 50 | Asn Leu Lys Ile Leu Trp Leu Arg Glu Phe Pro Leu Thr Ser Asp 1115 1120 1125 | | |
| | Ser Leu Ser Thr Ile Ala Arg Leu Pro Asn Leu Glu Glu Leu Ser 1130 1135 1140 | | |
| 55 | Leu Tyr His Thr Ile Ile His Gly Glu Glu Trp Asn Met Gly Glu 1145 1150 1155 | | |
| 60 | Glu Asp Thr Phe Glu Asn Leu Lys Phe Leu Asn Phe Asn Gln Val 1160 1165 1170 | | |
| 65 | Ser Ile Ser Lys Trp Glu Val Gly Glu Glu Ser Phe Pro Asn Leu 1175 1180 1185 | | |
| | Glu Lys Leu Lys Leu Arg Gly Cys His Lys Leu Glu Glu Ile Pro | | |

| | 1190 | 1195 | 1200 | |
|----|--|------|------|-----|
| 5 | Pro Ser Phe Gly Asp Ile Tyr Ser Leu Lys Ser Ile Lys Ile Val 1205 1210 1215 | | | |
| 10 | Lys Ser Pro Gln Leu Glu Asp Ser Ala Leu Lys Ile Lys Glu Tyr 1220 1225 1230 | | | |
| 15 | Ala Glu Asp Met Arg Gly Gly Asp Glu Leu Gln Ile Leu Gly Gln 1235 1240 1245 | | | |
| 20 | Lys Asn Ile Pro Leu Phe Lys 1250 1255 | | | |
| 25 | <210> 9 <211> 3774 <212> DNA <213> Lycopersicon lycopersicum | | | |
| 30 | <220> <221> CDS <222> (1)..(3774) <223> Mil.2 from tomato | | | |
| 40 | <400> 9 atg gaa aaa cga aaa gat att gaa gaa gca aac aac tca ttg gtg tta Met Glu Lys Arg Lys Asp Ile Glu Glu Ala Asn Asn Ser Leu Val Leu 1 5 10 15 | | | 48 |
| 45 | ttt tct gct ctt agc aag gac att gcc aat gtt cta att ttc cta gag Phe Ser Ala Leu Ser Lys Asp Ile Ala Asn Val Leu Ile Phe Leu Glu 20 25 30 | | | 96 |
| 50 | aat gag gaa aat caa aaa gct ctt gac aaa gat caa gtt gaa aag cta Asn Glu Glu Asn Gln Lys Ala Leu Asp Lys Asp Gln Val Glu Lys Leu 35 40 45 | | | 144 |
| 55 | aaa ttg aaa atg gca ttt att tgt aca tat gtt cag ctt tct tat tcc Lys Leu Lys Met Ala Phe Ile Cys Thr Tyr Val Gln Leu Ser Tyr Ser 50 55 60 | | | 192 |
| 60 | gat ttt gag cag ttt gaa gat ata atg act aga aat aga caa gag gtt Asp Phe Glu Gln Phe Glu Asp Ile Met Thr Arg Asn Arg Gln Glu Val 65 70 75 80 | | | 240 |
| 65 | gag aat ctg ctt caa tca ctt ttg gat gat gat gtc ctt act agc ctc Glu Asn Leu Leu Ser Leu Leu Asp Asp Asp Val Leu Thr Ser Leu 85 90 95 | | | 288 |
| 65 | acc agt aat atg gat gac tgt atc agc ttg tat cat cgt tct tat aaa Thr Ser Asn Met Asp Asp Cys Ile Ser Leu Tyr His Arg Ser Tyr Lys 100 105 110 | | | 336 |

40

| | | |
|----|---|------|
| | tca gat gcc atc atg atg gat gag caa ttg gac ttc ctc ctc ttg aat | 384 |
| | Ser Asp Ala Ile Met Met Asp Glu Gln Leu Asp Phe Leu Leu Leu Asn | |
| | 115 120 125 | |
| 5 | ctg tat cat cta tcc aag cat cac gct gaa aag ata ttt cct gga gtg | 432 |
| | Leu Tyr His Leu Ser Lys His His Ala Glu Lys Ile Phe Pro Gly Val | |
| | 130 135 140 | |
| 10 | act caa tat gaa gtt ctt cag aat gta tgt ggc aac ata aga gat ttc | 480 |
| | Thr Gln Tyr Glu Val Leu Gln Asn Val Cys Gly Asn Ile Arg Asp Phe | |
| | 145 150 155 160 | |
| 15 | cat ggg ttg ata ctg aat ggt tgc att aag cat gag atg gtt gag aat | 528 |
| | His Gly Leu Ile Leu Asn Gly Cys Ile Lys His Glu Met Val Glu Asn | |
| | 165 170 175 | |
| 20 | gtc tta cct ctg ttt caa ctc atg gct gaa aga gta gga cac ttc ctt | 576 |
| | Val Leu Pro Leu Phe Gln Leu Met Ala Glu Arg Val Gly His Phe Leu | |
| | 180 185 190 | |
| 25 | tgg gag gat cag act gat gaa gac tct cgg ctc tcc gag cta gat gag | 624 |
| | Trp Glu Asp Gln Thr Asp Glu Asp Ser Arg Leu Ser Glu Leu Asp Glu | |
| | 195 200 205 | |
| 30 | gat gaa cac aat gat aga gac tct cga ctc ttc cag cta aca cat cta | 672 |
| | Asp Glu His Asn Asp Arg Asp Ser Arg Leu Phe Gln Leu Thr His Leu | |
| | 210 215 220 | |
| 35 | ctc ttg aag att gtt cca act gaa ctg gag gtt atg cac ata tgt tat | 720 |
| | Leu Leu Lys Ile Val Pro Thr Glu Leu Glu Val Met His Ile Cys Tyr | |
| | 225 230 235 240 | |
| 40 | aca aat ttg aaa gct tca act tca gca gaa gtt gga cgc ttc att aag | 768 |
| | Thr Asn Leu Lys Ala Ser Thr Ser Ala Glu Val Gly Arg Phe Ile Lys | |
| | 245 250 255 | |
| 45 | aag ctc ctg gaa acc tca ccg gat att ctc aga gaa tat atc att caa | 816 |
| | Lys Leu Leu Glu Thr Ser Pro Asp Ile Leu Arg Glu Tyr Ile Ile Gln | |
| | 260 265 270 | |
| 50 | cta caa gag cat atg tta act gtt att ccc cct agc act tta ggg gct | 864 |
| | Leu Gln Glu His Met Leu Thr Val Ile Pro Pro Ser Thr Leu Gly Ala | |
| | 275 280 285 | |
| 55 | cga aac att cat gtc atg atg gaa ttc cta tta ctt att ctt tct gat | 912 |
| | Arg Asn Ile His Val Met Met Glu Phe Leu Leu Leu Ile Leu Ser Asp | |
| | 290 295 300 | |
| 60 | atg ccc aag gac ttt att cat cat gac aaa ctt ttt gat ctc ttg gct | 960 |
| | Met Pro Lys Asp Phe Ile His His Asp Lys Leu Phe Asp Leu Leu Ala | |
| | 305 310 315 320 | |
| 65 | cat gtt gga aca ctt acc agg gag gta tgc act ctt gta cgt gac ttg | 1008 |
| | His Val Gly Thr Leu Thr Arg Glu Val Ser Thr Leu Val Arg Asp Leu | |
| | 325 330 335 | |
| 70 | gaa gag aaa tta agg aat aaa gag ggt aat aac caa aca aat tgt gca | 1056 |
| | Glu Glu Lys Leu Arg Asn Lys Glu Gly Asn Asn Gln Thr Asn Cys Ala | |
| | 340 345 350 | |
| 75 | acc cta gac ttg ctg gaa aat att gaa ctc ctc aag aaa gat ctc aaa | 1104 |
| | Thr Leu Asp Leu Leu Glu Asn Ile Glu Leu Leu Lys Lys Asp Leu Lys | |
| | 355 360 365 | |
| 80 | cat gtt tat ctg aaa gcc cca aat tca tct caa tgt tgc ttc ccc atg | 1152 |
| | His Val Tyr Leu Lys Ala Pro Asn Ser Ser Gln Cys Cys Phe Pro Met | |
| | 370 375 380 | |

41

| | | |
|----|---|------|
| | agt gat gga cca ctc ttc atg cat ctt cta cac atg cac tta aat gat | 1200 |
| | Ser Asp Gly Pro Leu Phe Met His Leu Leu His Met His Leu Asn Asp | |
| | 385 390 395 400 | |
| 5 | ttg cta gat tct aat gct tat tca att tct ttg ata aag gaa gaa atc | 1248 |
| | Leu Leu Asp Ser Asn Ala Tyr Ser Ile Ser Leu Ile Lys Glu Glu Ile | |
| | 405 410 415 | |
| 10 | gag ttg gtg agt caa gaa ctg gaa ttc ata aga tca ttc ttt ggg gat | 1296 |
| | Glu Leu Val Ser Gln Glu Leu Glu Phe Ile Arg Ser Phe Phe Gly Asp | |
| | 420 425 430 | |
| 15 | gct gct gag caa gga ttg tat aaa gat atc tgg gca cgt gtt cta gat | 1344 |
| | Ala Ala Glu Gln Gly Leu Tyr Lys Asp Ile Trp Ala Arg Val Leu Asp | |
| | 435 440 445 | |
| 20 | gtg gct tat gag gca aaa gat gtc ata gat tca att att gtt cga gat | 1392 |
| | Val Ala Tyr Glu Ala Lys Asp Val Ile Asp Ser Ile Ile Val Arg Asp | |
| | 450 455 460 | |
| 25 | aat ggt ctc tta cat ctt att ttc tca ctt ccc att acc ata aag aag | 1440 |
| | Asn Gly Leu Leu His Leu Ile Phe Ser Leu Pro Ile Thr Ile Lys Lys | |
| | 465 470 475 480 | |
| 30 | atc aaa ctt atc aaa gaa gag atc tct gct tta gat gag aac att ccc | 1488 |
| | Ile Lys Leu Ile Lys Glu Glu Ile Ser Ala Leu Asp Glu Asn Ile Pro | |
| | 485 490 495 | |
| 35 | aag gac aga ggt cta atc gtt gtg aac tct ccc aag aaa cca gtt gag | 1536 |
| | Lys Asp Arg Gly Leu Ile Val Val Asn Ser Pro Lys Lys Pro Val Glu | |
| | 500 505 510 | |
| 40 | aga aag tca ttg aca act gat aaa ata att gta ggt ttt gag gag gag | 1584 |
| | Arg Lys Ser Leu Thr Thr Asp Lys Ile Ile Val Gly Phe Glu Glu Glu | |
| | 515 520 525 | |
| 45 | aca aac ttg ata ctt aga aag ctc acc agt gga ccc gca gat tta gat | 1632 |
| | Thr Asn Leu Ile Leu Arg Lys Leu Thr Ser Gly Pro Ala Asp Leu Asp | |
| | 530 535 540 | |
| 50 | gtc att tcg atc acc ggt atg ccg ggt tca ggt aaa act act ttg gca | 1680 |
| | Val Ile Ser Ile Thr Gly Met Pro Gly Ser Gly Lys Thr Thr Leu Ala | |
| | 545 550 555 560 | |
| 55 | tac aaa gta tac aat gat aag tca gtt tct aga cat ttt gac ctt cgt | 1728 |
| | Tyr Lys Val Tyr Asn Asp Lys Ser Val Ser Arg His Phe Asp Leu Arg | |
| | 565 570 575 | |
| 60 | gca tgg tgc acg gtc gat caa gga tat gac gac aag aag ttg ttg gat | 1776 |
| | Ala Trp Cys Thr Val Asp Gln Gly Tyr Asp Asp Lys Lys Leu Leu Asp | |
| | 580 585 590 | |
| 65 | aca att ttc agt caa gtt agt ggc tca gat tca aat ttg agt gag aat | 1824 |
| | Thr Ile Phe Ser Gln Val Ser Gly Ser Asp Ser Asn Leu Ser Glu Asn | |
| | 595 600 605 | |
| 70 | att gat gtt gct gat aaa ttg cgg aaa caa ctg ttt gga aag agg tat | 1872 |
| | Ile Asp Val Ala Asp Lys Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr | |
| | 610 615 620 | |
| 75 | ctt att gtc tta gat gat gtg tgg gat act act aca ttg gat gag ttg | 1920 |
| | Leu Ile Val Leu Asp Asp Val Trp Asp Thr Thr Leu Asp Glu Leu | |
| | 625 630 635 640 | |
| 80 | aca aga cct ttt cct gaa gct aag aaa gga agt agg att att ttg aca | 1968 |
| | Thr Arg Pro Phe Pro Glu Ala Lys Lys Gly Ser Arg Ile Ile Leu Thr | |
| | 645 650 655 | |

42

| | | |
|----|---|------|
| | act cga gaa aag gaa gtg gct ttg cat gga aag ctg aac act gat cct | 2016 |
| | Thr Arg Glu Lys Glu Val Ala Leu His Gly Lys Leu Asn Thr Asp Pro | |
| | 660 665 670 | |
| 5 | ctt gac ctt cga ttg cta aga cca gat gaa agt tgg gaa ctt tta gat | 2064 |
| | Leu Asp Leu Arg Leu Leu Arg Pro Asp Glu Ser Trp Glu Leu Leu Asp | |
| | 675 680 685 | |
| 10 | aaa agg aca ttt ggt aat gag agt tgc cct gat gaa cta tta gat gtc | 2112 |
| | Lys Arg Thr Phe Gly Asn Glu Ser Cys Pro Asp Glu Leu Leu Asp Val | |
| | 690 695 700 | |
| 15 | ggt aaa gaa ata gcc gaa aat tgt aaa ggg ctt cct ttg gtg gct gat | 2160 |
| | Gly Lys Glu Ile Ala Glu Asn Cys Lys Gly Leu Pro Leu Val Ala Asp | |
| | 705 710 715 720 | |
| 20 | ctg att gct gga gtc att gct ggg agg gaa aag aaa agg agt gtg tgg | 2208 |
| | Leu Ile Ala Gly Val Ile Ala Gly Arg Glu Lys Lys Arg Ser Val Trp | |
| | 725 730 735 | |
| 25 | ctt gaa gtt caa agt agt ttg agt tct ttt att ttg aac agt gaa gtg | 2256 |
| | Leu Glu Val Gln Ser Ser Leu Ser Ser Phe Ile Leu Asn Ser Glu Val | |
| | 740 745 750 | |
| 30 | gaa gtg atg aaa gtt ata gaa tta agt tat gac cat tta cca cat cac | 2304 |
| | Glu Val Met Lys Val Ile Glu Leu Ser Tyr Asp His Leu Pro His His | |
| | 755 760 765 | |
| 35 | ctc aag cca tgc ttg ctt cac ttt gca agt tgg ccg aag gac act cct | 2352 |
| | Leu Lys Pro Cys Leu Leu His Phe Ala Ser Trp Pro Lys Asp Thr Pro | |
| | 770 775 780 | |
| 40 | ttg aca atc tat ttg ttt act gtt tat ttg ggt gct gaa gga ttt gtg | 2400 |
| | Leu Thr Ile Tyr Leu Phe Thr Val Tyr Leu Gly Ala Glu Gly Phe Val | |
| | 785 790 795 800 | |
| 45 | gaa aag acg gag atg aag ggt ata gaa gaa gtg gtg aag att tat atg | 2448 |
| | Glu Lys Thr Glu Met Lys Gly Ile Glu Val Val Lys Ile Tyr Met | |
| | 805 810 815 | |
| 50 | gat gat tta att tcc agt agc ttg gta att tgt ttc aat gag ata ggt | 2496 |
| | Asp Asp Leu Ile Ser Ser Ser Leu Val Ile Cys Phe Asn Glu Ile Gly | |
| | 820 825 830 | |
| 55 | gat ata ctg aat ttc caa att cat gat ctt gtg cat gac ttt tgt ttg | 2544 |
| | Asp Ile Leu Asn Phe Gln Ile His Asp Leu Val His Asp Phe Cys Leu | |
| | 835 840 845 | |
| 60 | ata aaa gca aga aag gaa aat ttg ttt gat cgg ata aga tca agt gct | 2592 |
| | Ile Lys Ala Arg Lys Glu Asn Leu Phe Asp Arg Ile Arg Ser Ser Ala | |
| | 850 855 860 | |
| 65 | cca tca gat ttg ttg cct cgt caa att acc att gat tat gat gag gag | 2640 |
| | Pro Ser Asp Leu Leu Pro Arg Gln Ile Thr Ile Asp Tyr Asp Glu Glu | |
| | 865 870 875 880 | |
| 70 | gag gag cac ttt ggg ctt aat ttt gtc atg ttc gat tca aat aag aaa | 2688 |
| | Glu Glu His Phe Gly Leu Asn Phe Val Met Phe Asp Ser Asn Lys Lys | |
| | 885 890 895 | |
| 75 | agg cat tct ggt aaa cac ctc tat tct ttg agg ata aat gga gac cag | 2736 |
| | Arg His Ser Gly Lys His Leu Tyr Ser Leu Arg Ile Asn Gly Asp Gln | |
| | 900 905 910 | |
| 80 | ctg gat gac agt gtt tct gat gca ttt cac cta aga cac ttg agg ctt | 2784 |
| | Leu Asp Asp Ser Val Ser Asp Ala Phe His Leu Arg His Leu Arg Leu | |
| | 915 920 925 | |

| | | |
|----|---|------|
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| 5 | ttg ctg aat gaa ata tgc atg ttg aat cat ttg agg tac tta aga att Leu Leu Asn Glu Ile Cys Met Leu Asn His Leu Arg Tyr Leu Arg Ile 945 950 955 960 | 2880 |
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| 15 | cta gaa agt ctg ttt gtg tct aac aaa gga tca atc ttg gta cta tta Leu Glu Ser Leu Phe Val Ser Asn Lys Gly Ser Ile Leu Val Leu Leu 980 985 990 | 2976 |
| 20 | ccg aga att ttg gat ctt gta aag ttg cga gtg ctg tcc gtg ggt gct Pro Arg Ile Leu Asp Leu Val Lys Leu Arg Val Leu Ser Val Gly Ala 995 1000 1005 | 3024 |
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| 25 | aag gac aca aag tta gag aac ttg aga ata tta ggg gaa ctg ttg Lys Asp Thr Lys Leu Glu Asn Leu Arg Ile Leu Gly Glu Leu Leu 1025 1030 1035 | 3114 |
| 30 | att tcc tat tcg aaa gat aca atg aat att ttc aaa agg ttt ccc Ile Ser Tyr Ser Lys Asp Thr Met Asn Ile Phe Lys Arg Phe Pro 1040 1045 1050 | 3159 |
| 35 | aat ctt cag gtg ctt cag ttt gaa ctc aag gag tca tgg gat tat Asn Leu Gln Val Leu Gln Phe Glu Leu Lys Glu Ser Trp Asp Tyr 1055 1060 1065 | 3204 |
| 40 | tca aca gag caa cat tgg ttc ccg aaa ttg gat tgc cta act gaa Ser Thr Glu Gln His Trp Phe Pro Lys Leu Asp Cys Leu Thr Glu 1070 1075 1080 | 3249 |
| | cta gaa aca ctc tgt gta ggt ttt aaa agt tca aac aca aac cac Leu Glu Thr Leu Cys Val Gly Phe Lys Ser Ser Asn Thr Asn His 1085 1090 1095 | 3294 |
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| 50 | cct tca aat ttg aaa gaa ctg ttg ttg tat gac ttt cct ctg aca Pro Ser Asn Leu Lys Glu Leu Leu Leu Tyr Asp Phe Pro Leu Thr 1115 1120 1125 | 3384 |
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| | ttg tcc ctt tat gat aca atc atc cag gga gaa gaa tgg aac atg Leu Ser Leu Tyr Asp Thr Ile Ile Gln Gly Glu Glu Trp Asn Met 1145 1150 1155 | 3474 |
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 Pro Ser Asp Leu Leu Pro Arg Gln Ile Thr Ile Asp Tyr Asp Glu Glu
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| | <211> 16 | | |
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| 25 | <400> 92 | | 16 |
| | gatgagtcct gagtaa | | |
| 30 | <210> 93 | | |
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| 45 | <223> Rpi-blb or RB (Song, PNAS, 2003, 9128-9133) | | |
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| | Met Ala Glu Ala Phe Ile Gln Val Leu Leu Asp Asn Leu Thr Ser Phe | | |
| | 1 5 10 15 | | |
| 55 | ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa | | 96 |
| | Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln | | |
| | 20 25 30 | | |
| 60 | agg ctt tca agc atg ttt tct aca att caa gcc gtc ctt gaa gat gct | | 144 |
| | Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala | | |
| | 35 40 45 | | |
| 65 | cag gag aag caa ctc aac aac aag cct cta gaa aat tgg ttg caa aaa | | 192 |
| | Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys | | |
| | 50 55 60 | | |
| | ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa | | 240 |
| | Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys | | |

| | 65 | 70 | 75 | 80 | |
|----|---|------|----|----|--|
| 5 | acc aag gcc aca aga ttc tcc cag tct gaa tat ggc cgt tat cat cca Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro 85 90 95 | 288 | | | |
| 10 | aag gtt atc cct ttc cgt cac aag gtc ggg aaa agg atg gac caa gtg Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val 100 105 110 | 336 | | | |
| 15 | atg aaa aaa cta aag gca att gct gag gaa aga aag aat ttt cat ttg Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu 115 120 125 | 384 | | | |
| 20 | cac gaa aaa att gta gag aga caa gct gtt aga cgg gaa aca ggt tct His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser 130 135 140 | 432 | | | |
| 25 | gta tta acc gaa ccg cag gtt tat gga aga gac aaa gag aaa gat gag Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu 145 150 155 160 | 480 | | | |
| 30 | ata gtg aaa atc cta ata aac aat gtt agt gat gcc caa cac ctt tca Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser 165 170 175 | 528 | | | |
| 35 | gtc ctc cca ata ctt ggt atg ggg gga tta gga aaa acg act ctt gcc Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala 180 185 190 | 576 | | | |
| 40 | caa atg gtc ttc aat gac cag aga gtt act gag cat ttc cat tcc aaa Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys 195 200 205 | 624 | | | |
| 45 | ata tgg att tgt gtc tcg gaa gat ttt gat gag aag agg tta ata aag Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys 210 215 220 | 672 | | | |
| 50 | gca att gta gaa tct att gaa gga agg cca cta ctt ggt gag atg gac Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp 225 230 235 240 | 720 | | | |
| 55 | ttg gct cca ctt caa aag aag ctt cag gag ttg ctg aat gga aaa aga Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg 245 250 255 | 768 | | | |
| 60 | tac ttg ctt gtc tta gat gat gtt tgg aat gaa gat caa cag aag tgg Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp 260 265 270 | 816 | | | |
| 65 | gct aat tta aga gca gtc ttg aag gtt gga gca agt ggt gct tct gtt Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val 275 280 285 | 864 | | | |
| 70 | cta acc act act cgt ctt gaa aag gtt gga tca att atg gga aca ttg Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu 290 295 300 | 912 | | | |
| 75 | caa cca tat gaa ctg tca aat ctg tct caa gaa gat tgt tgg ttg ttg Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu 305 310 315 320 | 960 | | | |
| 80 | ttc atg caa cgt gca ttt gga cac caa gaa gaa ata aat cca aac ctt Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu 325 330 335 | 1008 | | | |
| 85 | gtg gca atc gga aag gag att gtg aaa aaa agt ggt ggt gtg cct cta Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu 340 345 350 355 360 | 1056 | | | |

| | | | | |
|----|---|------|-----|--|
| | 340 | 345 | 350 | |
| 5 | gca gcc aaa act ctt gga ggt att ttg tgc ttc aag aga gaa gaa aga Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg 355 360 365 | 1104 | | |
| 10 | gca tgg gaa cat gtg aga gac agt ccg att tgg aat ttg cct caa gat Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp 370 375 380 | 1152 | | |
| 15 | gaa agt tct att ctg cct gcc ctg agg ctt agt tac cat caa ctt cca Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro 385 390 395 400 | 1200 | | |
| 20 | ctt gat ttg aaa caa tgc ttt gcg tat tgt gcg gtg ttc cca aag gat Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp 405 410 415 | 1248 | | |
| 25 | gcc aaa atg gaa aaa gaa aag cta atc tct ctc tgg atg gcg cat ggt Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly 420 425 430 | 1296 | | |
| 30 | ttt ctt tta tca aaa gga aac atg gag cta gag gat gtg ggc gat gaa Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu 435 440 445 | 1344 | | |
| 35 | gta tgg aaa gaa tta tac ttg agg tct ttt ttc caa gag att gaa gtt Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val 450 455 460 | 1392 | | |
| 40 | aaa gat ggt aaa act tat ttc aag atg cat gat ctc atc cat gat ttg Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu 465 470 475 480 | 1440 | | |
| 45 | gca aca tct ctg ttt tca gca aac aca tca agc agc aat atc cgt gaa Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu 485 490 495 | 1488 | | |
| 50 | ata aat aaa cac agt tac aca cat atg atg tcc att ggt ttc gcc gaa Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu 500 505 510 | 1536 | | |
| 55 | gtg gtg ttt ttt tac act ctt ccc ccc ttg gaa aag ttt atc tcg tta Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu 515 520 525 | 1584 | | |
| 60 | aga gtg ctt aat cta ggt gat tcg aca ttt aat aag tta cca tct tcc Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser 530 535 540 | 1632 | | |
| 65 | att gga gat cta gta cat tta aga tac ttg aac ctg tat ggc agt ggc Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly 545 550 555 560 | 1680 | | |
| 70 | atg cgt agt ctt cca aag cag tta tgc aag ctt caa aat ctg caa act Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr 565 570 575 | 1728 | | |
| 75 | ctt gat cta caa tat tgc acc aag ctt tgt tgt ttg cca aaa gaa aca Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr 580 585 590 | 1776 | | |
| 80 | agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat ggt agc cag tca Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser 595 600 605 | 1824 | | |
| 85 | ttg act tgt atg cca cca agg ata gga tca ttg aca tgc ctt aag act Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr | 1872 | | |

| | 610 | 615 | 620 | |
|----|---|------|-----|--|
| 5 | cta ggt caa ttt gtt gtt gga agg aag aaa ggt tat caa ctt ggt gaa Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu 625 630 635 640 | 1920 | | |
| 10 | cta gga aac cta aat ctc tat ggc tca att aaa atc tcg cat ctt gag Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu 645 650 655 | 1968 | | |
| 15 | aga gtg aag aat gat aag gac gca aaa gaa gcc aat tta tct gca aaa Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys 660 665 670 | 2016 | | |
| 20 | ggg aat ctg cat tct tta agc atg agt tgg aat aac ttt gga cca cat Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His 675 680 685 | 2064 | | |
| 25 | ata tat gaa tca gaa gaa gtt aaa gtg ctt gaa gcc ctc aaa cca cac Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His 690 695 700 | 2112 | | |
| 30 | tcc aat ctg act tct tta aaa atc tat ggc ttc aga gga atc cat ctc Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu 705 710 715 720 | 2160 | | |
| 35 | cca gag tgg atg aat cac tca gta ttg aaa aat att gtc tct att cta Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu 725 730 735 | 2208 | | |
| 40 | att agc aac ttc aga aac tgc tca tgc tta cca ccc ttt ggt gat ctg Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu 740 745 750 | 2256 | | |
| 45 | cct tgt cta gaa agt cta gag tta cac tgg ggg tct gcg gat gtg gag Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu 755 760 765 | 2304 | | |
| 50 | tat gtt gaa gaa gtg gat att gat gtt cat tct gga ttc ccc aca aga Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg 770 775 780 | 2352 | | |
| 55 | ata agg ttt cca tcc ttg agg aaa ctt gat ata tgg gac ttt ggt agt Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser 785 790 795 800 | 2400 | | |
| 60 | ctg aaa gga ttg ctg aaa aag gaa gga gaa gag caa ttc cct gtg ctt Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu 805 810 815 | 2448 | | |
| 65 | gaa gag atg ata att cac gag tgc cct ttt ctg acc ctt tct tct aat Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn 820 825 830 | 2496 | | |
| 70 | ctt agg gct ctt act tcc ctc aga att tgc tat aat aaa gta gct act Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr 835 840 845 | 2544 | | |
| 75 | tca ttc cca gaa gag atg ttc aaa aac ctt gca aat ctc aaa tac ttg Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu 850 855 860 | 2592 | | |
| 80 | aca atc tct cgg tgc aat aat ctc aaa gag ctg cct acc agc ttg gct Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala 865 870 875 880 | 2640 | | |
| 85 | agt ctg aat gct ttg aaa agt cta aaa att caa ttg tgt tgc gca cta Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu | 2688 | | |

82

| | 885 | 890 | 895 | |
|----|---|------|-----|--|
| 5 | gag agt ctc cct gag gaa ggg ctg gaa ggt tta tct tca ctc aca gag Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu 900 905 910 | 2736 | | |
| 10 | tta ttt gtt gaa cac tgt aac atg cta aaa tgt tta cca gag gga ttg Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu 915 920 925 | 2784 | | |
| 15 | cag cac cta aca acc ctc aca agt tta aaa att cgg gga tgt cca caa Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln 930 935 940 | 2832 | | |
| 20 | ctg atc aag cgg tgt gag aag gga ata gga gaa gac tgg cac aaa att Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile 945 950 955 960 | 2880 | | |
| 25 | tct cac att cct aat gtg aat ata tat att taa Ser His Ile Pro Asn Val Asn Ile Tyr Ile 965 970 | 2913 | | |
| 30 | <210> 94 <211> 970 <212> PRT <213> Solanum bulbocastanum | | | |
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| 40 | Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln 20 25 30 | | | |
| 45 | Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala 35 40 45 | | | |
| 50 | Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys 50 55 60 | | | |
| 55 | Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys 65 70 75 80 | | | |
| 60 | Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro 85 90 95 | | | |
| 65 | Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val 100 105 110 | | | |
| | Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu 115 120 125 | | | |
| | His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser | | | |

| | 130 | 135 | 140 |
|----|--|-----|-----|
| 5 | Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu 145 150 155 160 | | |
| 10 | Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser 165 170 175 | | |
| 15 | Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala 180 185 190 | | |
| 20 | Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys 195 200 205 | | |
| 25 | Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys 210 215 220 | | |
| 30 | Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp 225 230 235 240 | | |
| 35 | Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg 245 250 255 | | |
| 40 | Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp 260 265 270 | | |
| 45 | Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val 275 280 285 | | |
| 50 | Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu 290 295 300 | | |
| 55 | Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu 305 310 315 320 | | |
| 60 | Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu 325 330 335 | | |
| 65 | Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu 340 345 350 | | |
| | Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg 355 360 365 | | |
| | Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp 370 375 380 | | |
| | Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro 385 390 395 400 | | |
| | Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp | | |

| | 405 | 410 | 415 |
|----|--|-----|-----|
| 5 | Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly 420 425 430 | | |
| 10 | Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu 435 440 445 | | |
| 15 | Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val 450 455 460 | | |
| 20 | Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu 465 470 475 480 | | |
| 25 | Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu 485 490 495 | | |
| 30 | Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu 500 505 510 | | |
| 35 | Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu 515 520 525 | | |
| 40 | Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser 530 535 540 | | |
| 45 | Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly 545 550 555 560 | | |
| 50 | Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr 565 570 575 | | |
| 55 | Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr 580 585 590 | | |
| 60 | Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser 595 600 605 | | |
| 65 | Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr 610 615 620 | | |
| 70 | Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu 625 630 635 640 | | |
| 75 | Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu 645 650 655 | | |
| 80 | Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys 660 665 670 | | |
| 85 | Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His | | |

| | 675 | 680 | 685 |
|----|--|-----|-----|
| 5 | Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His 690 695 700 | | |
| 10 | Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu 705 710 715 720 | | |
| | Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu 725 730 735 | | |
| 15 | Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu 740 745 750 | | |
| 20 | Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu 755 760 765 | | |
| 25 | Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg 770 775 780 | | |
| 30 | Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser 785 790 795 800 | | |
| | Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu 805 810 815 | | |
| 35 | Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn 820 825 830 | | |
| 40 | Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr 835 840 845 | | |
| 45 | Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu 850 855 860 | | |
| 50 | Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala 865 870 875 880 | | |
| | Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu 885 890 895 | | |
| 55 | Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu 900 905 910 | | |
| 60 | Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu 915 920 925 | | |
| 65 | Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln 930 935 940 | | |
| | Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile | | |

945

950

955

960

5 Ser His Ile Pro Asn Val Asn Ile Tyr Ile
965 970

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